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Historical Release Report

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ABBREVIATIONS, ACRONYMS, AND INITIALISMS

AL	action level
ALF	Action Level and Standards Framework for Surface Water, Groundwater & Soil
AOC	Area of Concern
bgs	below ground surface
BZ	Buffer Zone
BZSAP	Buffer Zone Sampling and Analysis Plan
CAD/ROD	Corrective Action Decision/Record of Decision
CCR	Code of Colorado Regulations
CDH	Colorado Department of Health
CDPHE	Colorado Department of Public Health and Environment
CEARP	Comprehensive Environmental Assessment and Response Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHWA	Colorado Hazardous Waste Act
Ci	curie
cm ²	square centimeter
CMS/FS	Corrective Measures Study/Feasibility Study
COC	contaminant of concern
CPIR	Contingency Plan Implementation Report
cpm	counts per minute
CRA	Comprehensive Risk Assessment
CSV	Central Storage Vault
CWTS	Caustic Waste Treatment System
D&D	Decontamination And Decommissioning
DCHP	dicesium hexachloroplutonate
DOE	U S Department of Energy
dpm	disintegrations per minute
dpm/kg	disintegrations per minute per kilogram
dpm/L	disintegrations per minute per liter
dpm/m ²	disintegrations per minute per square meter
DU	depleted uranium
EG&G	EG&G Rocky Flats, Inc
EP	Extraction Procedure
EPA	U S Environmental Protection Agency
ER	Environmental Restoration
FIDLER	Field Instrument for the Detection of Low-Energy Radiation
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
ft	foot/feet
ft ²	square feet
FY	Fiscal Year
g	gram
GIS	geographic information system
GPR	Ground Penetrating Radar
HAER	Historic American Engineering Record
HEPA	high-efficiency particulate air

ABBREVIATIONS, ACRONYMS, AND INITIALISMS

HEUN	highly enriched uranium
HI	Hazard Index
HNO ₃	nitric acid
HPGe	High Purity Germanium
HQ	Headquarters
HRR	Historical Release Report
IA	Industrial Area
IAG	Interagency Agreement
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
ITPH	Interceptor Trench Pump House
K-H	Kaiser-Hill Company, L L C
kg	kilogram
LANL	Los Alamos National Laboratory
LLW	low-level waste
μCi/g	microcuries per gram
μg/kg	micrograms per kilogram (ppb)
μg/L	micrograms per liter (ppb)
m ²	square meter
MDL	method detection limit
MH	manhole
mg/kg	milligrams per kilogram (ppm)
mg/L	milligrams per liter (ppm)
mrem	millirem
mr/hr	millirem per hour
nCi/g	nanocuries per gram
NaI	sodium iodide
NCR	no carbon required
NFA	No Further Action
NFAA	No Further Accelerated Action
NFRA	No Further Remedial Action
NPDES	National Pollutant Discharge Elimination System
NPWL	New Process Waste Lines
OPWL	Original Process Waste Lines
OU	Operable Unit
PA	Protected Area
PAC	Potential Area of Concern
PAM	Proposed Action Memorandum
PCB	polychlorinated biphenyl
pCi/g	picocuries per gram
pCi/L	picocuries per liter
PCOC	potential contaminant of concern
PIC	Potential Incident of Concern

ABBREVIATIONS, ACRONYMS, AND INITIALISMS

PMJM	Preble's meadow jumping mouse
POC	Point of Compliance
POE	Point of Evaluation
PRG	Preliminary Remediation Goal
ppt	parts per trillion
PSZ	Perimeter Security Zone
PU&D	Property Utilization and Disposal
PVC	polyvinyl chloride
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RCT	Radiological Control Technician
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFEO	Rocky Flats Field Office
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RFP	Rocky Flats Plant
RI	Remedial Investigation
RMRS	Rocky Mountain Remediation Services, L L C
RSAL	radionuclide soil action level
RSOP	RFCA Standard Operating Protocol
SAP	Sampling and Analysis Plan
SEP	Solar Evaporation Ponds
SID	South Interceptor Ditch
Site	Rocky Flats Environmental Technology Site
SNM	special nuclear material
SOR	sum of ratio
SSRS	Subsurface Soil Risk Screen
STP	Sewage Treatment Plant
SVOC	semivolatile organic compound
S&W	Swinerton & Walberg
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
TDEM	time-domain electromagnetic
TEF	toxicity equivalent factor
TEQ	toxicity equivalent
TRU	transuranic
UBC	Under Building Contamination
UCL	upper confidence limit
VOC	volatile organic compound
WARP	Well Abandonment and Replacement Program
WHO	World Health Organization
WRW	Wildlife Refuge Worker
yd ³	cubic yard

Section 1

1.0 INTRODUCTION

The Rocky Flats Environmental Technology Site (RFETS) (the Site) began operation in 1951. Since 1951, materials defined as hazardous substances, pollutants, and contaminants by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and materials defined as hazardous waste and hazardous constituents by the Resource Conservation and Recovery Act (RCRA) and/or the Colorado Hazardous Waste Act (CHWA), have been produced, purchased, stored, consumed, disposed, and released at various locations at RFETS. Contaminants remain within some facility tank and pipe systems and filter plenums. Certain contaminants have been detected and remain in groundwater, sediments, surface water, and soil at the Site and thus pose potential human health and environmental risks.

RCRA regulations require that all Solid Waste Management Units (SWMUs) be identified. This became applicable to RFETS with the signing of a Compliance Agreement on July 31, 1986. At that time, the exact definition of a SWMU had not been formalized, therefore, guidance from the State of Colorado and the regional office of the U S Environmental Protection Agency (EPA) was used. The State of Colorado and EPA required the identification of all areas where environmental releases may have occurred, including hazardous waste and nonhazardous waste-related releases. Also included were single-release areas and long-term waste management areas where waste storage may (or is known to) have occurred.

SWMUs were initially identified in 1985 by the U S Department of Energy (DOE) Los Alamos Operations Office and are presented in the Draft Comprehensive Environmental Assessment and Response Program (CEARP) Phase I Installation Assessment. The study consisted of a records search, open literature survey, and interviews with RFETS employees. The SWMU terminology is a RCRA designation consisting of inactive waste disposal sites, accidentally contaminated sites, and sites found to pose environmental concern due to past or current waste management practices. Inspections were conducted at each site. The first identification of RFETS SWMUs, consistent with the guidance provided by the State of Colorado and the regional EPA, was presented as an appendix to the November 1986 RCRA Part B Permit Application.

Formal efforts to document the extent of Site contamination were established with the signing of the Interagency Agreement (IAG) in 1991. At that time, SWMUs at RFETS were renamed Individual Hazardous Substance Sites (IHSSs). IHSS is a term defined in the IAG as "locations associated with a release or threat of release of hazardous substances that may cause harm to human health/or the environment." The term IHSS is used today at RFETS. The IAG grouped IHSSs by similar contaminant or geographic location into 16 larger Operable Units (OUs), and schedules were set for further characterization. In accordance with the IAG, a Historical Release Report (HRR) was developed. The original intent of the HRR was to capture existing information on historical incidents and plant practices involving hazardous substances at RFETS. Additionally, the IAG prescribed that the HRR reporting process continue quarterly for

reporting of new or newly identified releases of hazardous substances to the environment (now identified as Potential Areas of Concern [PACs])

In 1996, the Rocky Flats Cleanup Agreement (RFCA) superceded the IAG RFCA incorporated the earlier IAG requirements for updating the HRR, however, it was agreed that reporting would be required annually instead of quarterly The first Annual Update was submitted in September 1996

The 16 OUs designated in the IAG were consolidated into 10 OUs during the RFCA negotiation process to reduce field and administrative requirements The consolidation of former OUs is presented in Table 1.1

Table 1.1
RFCA Consolidation of Former OUs

IAG Operable Unit Designation	RFCA Operable Unit Designation
OU 1	Closed under CAD/ROD
OU 2	Incorporated into Buffer Zone OU
OU 3	Closed under CAD/ROD
OU 4	Incorporated into Industrial Area OU
OU 5	Unchanged Under RFCA
OU 6	Unchanged Under RFCA
OU 7	Unchanged Under RFCA
OU 8	Incorporated into Industrial Area OU
OU 9	Incorporated into Industrial Area OU
OU 10	Incorporated into Industrial Area OU
OU 11	Closed Under CAD/ROD
OU 12	Incorporated into Industrial Area OU
OU 13	Incorporated into Industrial Area OU
OU 14	Incorporated into Industrial Area OU
OU 15	Closed Under CAD/ROD
OU 16	Closed Under CAD/ROD

At that time, Corrective Action Decisions/Record of Decisions (CADs/RODs) for OUs 11, 15, and 16 were already complete and CADs/RODs for OUs 1, 3, 5, 6, and 7 were in process or expected For this reason these OUs retained their IAG designations The Buffer Zone (BZ) OU incorporates all IHSSs from OU 2, IHSSs 170, 174A, and 174B from the former OU 10, and all PACs within those IHSSs and the BZ The Industrial Area (IA) OU incorporates all IHSSs from OUs 4, 8, 9, 12, 13, and 14, IHSSs 115 and 196 from OU 6, all IHSSs from OU 10 with the exception of 170, 174A, and 174B, and all PACs and Under Building Contamination (UBC) Sites located within the IA

1.1 2003 Annual Update to the Historical Release Report

Beginning in Fiscal Year (FY) 03, the No Further Action (NFA) designation was changed to No Further Accelerated Action (NFAA) to denote that other actions as determined in the CAD/ROD may be conducted. Text contained within this Annual Update includes new information gathered to update previous IHSS, PAC, or UBC Site descriptions and DOE Rocky Flats Field Office (RFFO) recommendations for NFAA or No Further Remedial Action (NFRA). These recommendations are based on process knowledge, analytical data from characterization and/or verification sampling, conservative risk-based screens, or formally conducted personal interviews. Where the IHSS, PAC, or UBC Site has already been granted NFAA status, the date of NFAA approval and the reference to the Closeout or Data Summary Report is included.

This document has been prepared in accordance with Part 9, Subpart B, paragraph 119 (l) of RFCA (DOE et al 1996), Notification of Spills, Releases, or Findings, and is presented in the format described below. For this reporting period, August 1, 2002, through August 1, 2003, there were no additional HRR reportable spills, releases, or findings of contaminants identified at RFETS.

For purposes of the HRR process and mapping clarity, original IHSS locations were designated a unique "PAC area" prefix number based upon geographic location. For example, IHSS 123 1 is designated as PAC 700-123 1. An area where there has been a recent release or finding of a hazardous substance in the environment (post-1992) is also assigned a PAC area prefix number, followed by the next numerically highest PAC reference number for that area. These areas are referred to as PACs and are equivalent to IHSSs in that they are CERCLA sites requiring disposition through the HRR and CERCLA reporting process. PAC prefixes are selected according to 14 geographic subdivisions, as illustrated on Figure 1.1. Large PAC areas (i.e., PACs that cross geographic PAC boundaries), such as the Original Process Waste Lines (OPWL), (PAC #000-121) and the Central Avenue Ditch (PAC #000-172), have been assigned a 000 prefix due to their boundary extent. To date, there are 12 IHSSs and/or PACs with the 000 prefix.

In addition to the 14 geographic areas, potential UBC Sites were also discussed in the original HRR (DOE 1992). UBC areas were necessary because of the potential contamination of soil under specific buildings from broken process waste lines or other potential sources related to the building histories. Appendix 4, Plate #4, Potential Areas of Concern, shows the UBC locations identified at RFETS.

RFCA defines the NFAA remedy selection as the determination that accelerated actions are not currently warranted, however, such decisions are subject to revisitation at the time of the Final CAD/ROD. The Agency Acceptance Form included in past Quarterly and Annual Updates to the HRR was discontinued in the FY2000 Annual Update. As such, the current IHSS, PAC, and UBC Site regulatory status will be determined as part of an ongoing process between RFETS personnel and regulatory agencies. This Annual Update is divided into three sections and four appendices. They are described as follows:

Section 1.0 is a historical summary of the HRR process and identifies the contents of this document. Section 1.0 includes three tables, as follows:

Table 1.1, located in the introductory background section, provides an overview of the OUs that resulted from regulatory agreements (that is, the IAG and RFCA).

Table 1.2 is provided as a summary of the IHSS, PAC and UBC Site status contained within this Annual Update to the HRR.

Table 1.2
HRR PAC UBC Narrative Updates Contained in This Annual Report

IHSS	IHSS Group	OU	PAC	Site Description	Update	Status
111.1	NA	BZ	NE-111.1	Trench T-4	1996 Annual Update 1997 Annual Update	Approved 6-12-03
111.4	NE-1	BZ	NE-111.4	Trench T-7	NA	Approved 6-12-03
216.2	NE/NW	BZ	NE-216.2	East Spray Field	1997 Annual Update	Proposed
216.3	NE/NW	BZ	NE-216.3	East Spray Field	1997 Annual Update	Proposed
NA	NE/NW	BZ	NE-1407	OU 2 Treatment Facility	Quarterly 7 and 8	Proposed
NA	NE/NW	BZ	NE-1412	Trench T-12	Quarterly 10	Proposed
NA	NE/NW	BZ	NE-1413	Trench T-13	Quarterly 10	Proposed
174a	NE/NW	BZ, OU 10	NW-174a	PU&D Yard Container Storage Area	1997 Annual Update 1998 Annual Update	Proposed
133.1	SW-1	BZ	SW-133.1	Ash Pit 1	2001 Annual Update	Approved 6-12-03
133.2	SW-1	BZ	SW-133.2	Ash Pit 2	2001 Annual Update 2002 Annual Update	Approved 6-12-03
133.4	SW-1	BZ	SW-133.4	Ash Pit 4	2001 Annual Update 2002 Annual Update	Approved 6-12-03
1702	SW-1	BZ	SW-1702	Recently Identified Ash Pit (also referred to as TDEM-2)	2001 Annual Update	Approved 6-12-03
101	000-1	IA, OU 4	000-101	Solar Evaporation Ponds	1998 Annual Update	Approved 7-29-03
148	100-4	IA, OU 13	100-148	Waste Leaks	2002 Annual Update	Approved 4-22-03
NA	100-5	IA	100-609	Security Incinerator	2002 Annual Update	Approved 4-22-03
NA	100-4	IA	100-611	Building 123 Scrubber Solution Spill	2002 Annual Update	Approved 4-22-03
128	300-1	IA, OU 13	300-128	Oil Burn Pit No. 1	NA	Approved 6-20-03
134N	300-1	IA, OU 13	300-134(N)	Lithium Metal Destruction Site	NA	Approved 6-20-03
171	300-1	IA, OU 13	300-171	Solvent Burning Ground	NA	Approved 6-20-03
NA	300-6	IA	300-702	Pesticide Shed	NA	Approved 7-21-03
NA	600-2	IA	400-802	Storage Shed South of Building 334	NA	Approved 6-19-03
NA	400-10	IA	400-807	Sandblasting Area	NA	Approved 7-15-03
NA	500-6	IA	500-906	Asphalt Surface Near Building 559	2002 Annual Update	Approved 7-16-03
NA	500-7	IA	500-907	Tanker Truck Release of Hazardous Waste from Tank 231B	NA	Approved 6-9-03
120.2	400-10	IA, OU 12	600-120.2	Fiberglassing Area West of Building 664	NA	Approved 7-15-03

IHSS	IHSS Group	PAC	UBC	Site Description	Annual Update	Approval Date
161	400-10	IA, OU 14	600-161	Radioactive Site West of Building 664	NA	Approved 7-15-03
NA	600-1	IA	600-1001	Temporary Waste Storage Building 663	1997 Annual Update	Approved 6-24-03
NA	600-6	IA	600-1005	Former Pesticide Storage Area	2002 Annual Update	Approved 5-15-03
150 6	700-7	IA, OU 8	700-150 6	Radioactive Site South of Building 779	NA	Proposed
150 8	700-7	IA, OU 8	700-150 8	Radioactive Site Northeast of Building 779	NA	Proposed
NA	700-12	NA	700-1106	Process Waste Spill – Portal 1	2002 Annual Update	Approved 5-15-03
164 2	800-4	IA, OU 14	800-164 2	Radioactive Site 800 Area Site #2, Building 886 Spills	NA	Approved 5-15-03
164 3	800-6	IA, OU 14	800-164 3	Radioactive Site 800 Area Site #2, Building 889 Storage Pad	NA	Approved 3-25-03
NA	800-2	IA	800-1205	Building 881, East Dock	NA	Approved 7-16-03
140	900-11	BZ	900-140	Hazardous Disposal Area, part of IHSS 155	1997 Annual Update 1998 Annual Update 2000 Annual Update	Proposed
153	900-2	BZ	900-153	Oil Burn Pit No 2	1999 Annual Update	Proposed 8-16-03
154	900-2	BZ	900-154	Pallet Burn Site	1999 Annual Update	Proposed 8-16-03
165	000-1	IA, OU 6	900-165	Triangle Area	NA	Approved 7-29-03
175	900-4&5	IA, OU 10	900-175	S&W Building 980 Contractor Storage Facility	NA	Approved 7-23-03
176	000-1	IA, OU 10	900-176	S&W Contractor Storage Yard	NA	Approved 7-29-03
NA	100-4	IA	UBC 123	Health Physics Laboratory	2002 Annual Update	Approved 4-22-03
NA	300-3	IA	UBC 371	UBC 371 – Plutonium Recovery	NA	Approved 8-21-03
NA	300-4	IA	UBC 374	UBC 374 – Waste Treatment Facility	NA	Approved 8-21-03
NA	700-7	IA	UBC 776	Original Plutonium Foundry	NA	NA
NA	700-7	IA	UBC 777	General Plutonium Research and Development	NA	NA
NA	800-2	IA	UBC 881	UBC 881 – Laboratory and Office	NA	Approved 7-16-03
NA	800-4	IA	UBC 886	UBC 886 – Critical Mass Laboratory	2001 Annual Update	Approved 5-15-03
NA	800-6	IA, OU 14	UBC 889	UBC-889 Decontamination and Waste Reduction		Approved 3-25-03
NA	900-1	NA	UBC 991	UCB 991 Tunnel	NA	Approved 8-21-03

Table 1.3 is an up-to-date account of (1) the number of geographic areas (i.e., IHSSs, PACs, and UBC Sites) accepted as proposed NFAA, either by written concurrence from the regulatory agencies or through the CAD/ROD process, (2) the number of geographic areas “proposed” for NFAA since the 1992 HRR, for which concurrence has not been received from the regulatory agencies, and (3) the number of total geographic areas warranting further research, investigation, or action

Table 1.3
HRR Site Tracking and Status Through August 2003

HRR Site Status	IHSS/UBC Sites	PIC
Proposed NFAA Accepted (CAD/ROD Process or other approval)	150	48
Proposed NFAA (Pending Agency Review)	29	0
Potential Further Action Warranted	180	13
Total	359	61

*PIC – potential incident of concern

Section 2.0 provides revised PAC/UBC Site narratives and incorporates new information regarding previously designated HRR sites. The revised narratives include the following types of information:

- Additional information or findings related to previously designated CERCLA sites, such as new data, boundary changes, corrections identified, etc ,
- Proposed NFAA/NFRA status based upon process knowledge, analytical data, conservative risk-based screening, source removal (or approved treatment) of contaminants in accordance with agency-approved decision documents, such as the IA Sampling and Analysis Plan (SAP) (IASAP), BZSAP, subsequent SAP addenda, Proposed Action Memorandums (PAMs), Interim Measure/Interim Remedial Actions (IM/IRAs), or other authorizing decision documents,
- Additional information requested by the regulatory agencies during the comment and response period to meet the proposed NFAA criteria,
- Approved NFAA status based upon final CAD/ROD or other authorizing documentation, such as letters from the regulatory agencies, and
- Accelerated actions taken within the Environmental Restoration (ER) framework of field activities

Section 3.0 briefly describes events for several environmental projects that occurred at the Site during the reporting period that are considered significant and should be documented. Information regarding the RFCA Modification, the Solar Evaporation Ponds (SEP) (IHSS 101), the Original Plant Incinerator (IHSS 133) Present Landfill (IHSS 114), Original Landfill (IHSS 115), 903 Pad and Lip Areas, and a comprehensive list (Table 3.5) of buildings and structures that have been demolished through the Decontamination and Decommissioning (D&D) process at the Site are included.

Appendix 1 provides a list of all sites identified in the original HRR, Quarterly Updates, and Annual Updates to date. A cross-reference with IHSS/UBC Site number (if

applicable), IHSS numbers for PACs occurring within an IHSS boundary, and OU designation is provided in accordance with RFCA. Additionally, Appendix 1 provides a reference to Quarterly or Annual Reports updating the information provided in the original PAC identification. Recommendation for a PAC as a Proposed NFAA or Approved for NFAA is also provided, along with a reference to the Quarterly or Annual Report the designation was assigned. HRR sites, which have been approved for NFAA as proposed are presented with the approval date and applicable footnote.

Appendix 2 provides specific HRR correspondence letters from the regulatory agencies. The letters pertain to reviews of HRR Quarterly Update and Annual Update Reports. Resolution of issues and disposition of the subject PACs, IHSSs, and UBC Sites will be addressed through ongoing discussions and correspondence with the regulatory agencies. In brief, the letters conditionally document acceptance of proposed NFAA status, request additional information or data for some PACs or IHSSs that were proposed NFAA, or specify nonconcurrence with the PAC/IHSS or UBC Site proposed for NFAA in the HRR reporting process.

Appendix 3 provides notification and documentation for replacement/movement of soil that has undergone a hazardous and radiological constituent analysis (i.e., comparison to RFCA Action Levels [ALs]). This reporting is consistent with RFCA Attachment 5 or the approval agreement for the RFCA Standard Operating Protocol (RSOP) for Asphalt and Soil Management. Reporting and documentation include a summary of the movement activity, volumes, origination, receiving sites, and contamination type(s). This appendix is identified as a "place-keeper" to describe and map such locations. If an accelerated action was conducted and soil was returned as part of the action, the information is included in the associated Closeout Report. There were no soil excavations exceeding the proposed RFCA ALs relocated to locations outside the originating IHSS, PAC, or UBC site during this reporting period. Figure A-3.1 shows where such relocation/put-back decisions occurred historically.

Appendix 4 contains four plates and presents the most current and accurate IHSS, PAC, and UBC Site boundaries and status. The RFCA Consolidated OU Map presented in RFCA and the original HRR PAC Area format are combined and illustrated as Plate #1. Plate #1 only illustrates IHSSs for which further investigation or action is warranted (as proposed in the HRR reporting process). Final NFAA/NFRA and proposed NFAA/NFRA IHSSs, PACs and UBC Sites are illustrated on a separate coverage (Plate #2), thereby easily delineating between the HRR sites that require further action and progress made toward Site remediation. In addition, due to the complex nature of the original and new process waste transfer systems (IHSS 121 and PAC 000-504, respectively) and associated IHSSs resulting from these lines, an additional map (Plate #3) illustrates these areas on a separate coverage. All areas shown on Plate #3 require further investigation at the present time. Plate #3 was revised in FY2000 to show areas of known or suspected leaks within the waste transfer system piping, and specific line section numbers. This plate also identifies the type of material used for piping, results of pressure tests, and whether the pipe has been abandoned or is in current use. Several upgrades were made relevant to the process waste line coverage during this reporting

period The PAC and UBC map (Plate #4) is consistent with past HRR Update Reports and shows PAC and UBC Sites that require further investigation

1.2 Summary

This report is intended to provide a comprehensive compilation of historical information updated to reflect present conditions and response actions at RFETS with regard to environmental releases or significant events. It is not the intention of this Annual Update or past updates to change or amend researched information in the original HRR, but rather to provide additional facts for specific areas as they become available. Prior to initiating work within any designated area, all available documents should be reviewed, including, but not limited to, Environmental Technical Memorandums, Data Summary Reports, project specific-decision documents, and Accelerated Action Completion Reports.

1.3 References

DOE, 1992, Historical Release Report for the Rocky Flats Plan, Golden Colorado, June

DOE, EPA, CDPHE, 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, April

Section 2

PAC REFERENCE NUMBER: NE-111.1

IHSS Number 111 1 (Buried T3/T4 Soil Enveloped in Geotextile Fabric)
Operable Unit Buffer Zone
IHSS Group NA
Unit Name Trench T-4
Approximate Location N750,000, E2,087,500

Date(s) of Operation or Occurrence

Not applicable (see Description of Operation or Occurrence)

Description of Operation or Occurrence

In 1996, a removal action was conducted for Trenches T-3 and T-4 in the East Trenches area. The waste in the trenches was a source for groundwater volatile organic compound (VOC) contamination in this area. The action consisted of excavating approximately 5,000 cubic yards of material from the trenches, followed by thermal desorption processing of the material. With concurrence from the regulatory agencies, approximately 250 cubic yards of the processed material was returned to the trench enveloped in a geotextile fabric because contaminants exceeded the 1996 Draft RFCA Tier II radionuclide soil action levels (RSALs).

Physical/Chemical Description of Constituents Released

The soil that is wrapped in a geotextile fabric and buried in Trench T-4 contains low levels of radionuclides. The soil was treated using thermal desorption, therefore, VOCs are not expected to be present.

Responses to Operation or Occurrence

Not applicable

Fate of Constituents Released to Environment

NFAA for Trench T-4 was proposed in the 1997 Annual Update for the HRR (DOE 1997). Regulatory agency approval of the NFAA proposal is documented in a letter from Colorado Department of Health and Environment (CDPHE) and EPA to Mr. Joe Legare dated July 9, 1999 (Appendix 2). Comments provided with the approval letter indicate the approval may need to be reviewed if the RSALs are revised in the future. New soil

ALs, for protection of a Wildlife Refuge Worker (WRW), were approved in June 2003 (DOE et al 2003). An integrated risk-based approach (application of the Subsurface Soil Risk Screen) for evaluating the need for, or extent of accelerated actions at PACs was also approved. Therefore, the buried soil in Trench T-4 that is enveloped in a geotextile fabric has been reassessed to render a NFAA determination using the new ALs and the Subsurface Soil Risk Screen.

Application of the Subsurface Soil Risk Screen

Screen 1 – Are contaminant of concern (COC) concentrations below Table 3 WRW soil AL?

No. As shown in Table 2.1, one sample of the material in the geotextile fabric exceeds the uranium-238 AL of 351 picocuries per gram (pCi/g). The concentration of uranium-238 in the sample is 358 pCi/g, a value just above the AL. The mean concentration of all samples is 139 pCi/g, which is substantially below the AL.

Table 2.1
Radiochemical Results for Trenches T3/T4 Soil with FIDLER Readings Greater Than 5,000 cpm

Sample Number	U-234 Result (pCi/g) AL = 300	U-235 Result (pCi/g) AL = 8	U-238 Result (pCi/g) AL = 351	Am-241 Result (pCi/g) AL = 1	Po-210 Result (pCi/g) AL = 0.1
SS01019RM	3.32	1.05	36.40	1.17	5.83
SS01020RM	3.17	1.24	53.03	1.14	5.70
SS01021RM	3.18	1.03	32.05	1.47	7.36
SS01022RM	3.19	1.92	103.77	0.85	4.23
SS01023RM	3.33	1.08	40.83	0.72	3.59
SS01024RM	3.35	0.78	31.62	0.81	4.06
SS01025RM	3.15	2.50	144.55	1.25	6.27
SS01026RM	3.13	1.44	76.81	0.91	4.57
SS01027RM	3.79	2.00	130.55	1.77	8.85
SS01028RM	3.67	4.35	274.99	2.39	11.97
SS01029RM	4.23	5.75		3.11	15.57
SS01030RM	3.84	2.84	181.23	1.29	6.44
SS01031RM	4.36	5.30	293.17	1.87	9.34
SS01032RM	3.76	2.76	148.81	2.30	11.49
SS01033RM	3.86	3.04	149.77	1.24	6.18
SS01034RM	3.48	4.65	173.90	1.25	6.24
Average	3.55	2.61	139.37	1.47	7.36

Shading indicates exceedance of the AL

Screen 2 – Is there potential for subsurface soil to become surface soil?

No. Trench T-4 is not in an area prone to landslides, as shown in RFCA Attachment 5, Figure 1 (DOE et al 2003).

Screen 3 – Does subsurface soil radiological contamination exceed criteria in Section 5.3 and Attachment 14?

No As shown in Table 2 1, plutonium concentrations are well below the soil AL of 50 pCi/g, and, therefore, further analysis with respect to the allowable higher concentrations for subsurface soil as identified in Action Level and Standards Framework for Surface Water, Groundwater, and Soils (ALF) Section 5 3(C)(2) (DOE et al 2003), is not required

Screen 4 – Is there an environmental pathway and sufficient quantity of COC that would cause exceedance of surface water standards (SWS)?

No Contaminant migration via erosion and groundwater are the two possible pathways whereby surface water could become contaminated by Trench T-4 However, erosion is an insignificant pathway because Trench T-4 is in a flat-lying area not prone to erosion, and the waste material is covered by approximately 2 feet of soil The East Trenches Plume Groundwater Collection and Treatment System is located downgradient of Trench T-4 The zero-valence iron treatment system is effective in the removal of uranium, which is the principal contaminant of concern (COC)

Screen 5 – Are COC concentrations above Table 3 Action Levels for ecological receptors?

No Radionuclides are the COCs , and the ALs for protection of ecological receptors are higher than for protection of a WRW

Stewardship Evaluation

Application of the Subsurface Soil Risk Screen to NE-111 1 indicates NFAA is necessary for protection of public health and the environment However, because subsurface soil at this PAC has contaminant concentrations that exceed soil ALs, both near-term and long-term stewardship actions have been recommended They are discussed below

Near-Term Management Recommendations

Near-term recommendations for environmental stewardship include the following

- Excavation at the site will continue to be controlled through the Site Soil Disturbance Permit process
- Site access and security controls will remain in place pending implementation of long-term controls

Long-Term Stewardship Recommendations

Based on remaining environmental conditions at NE-111 1, no specific long-term stewardship activities are recommended beyond the generally applicable Site

requirements that may be imposed on this area in the future, which are dependent upon the final remedy selected. Institutional controls that will be used as appropriate for this area include the following:

- Prohibitions on construction of buildings,
- Restrictions on excavation or other soil disturbance, and
- Prohibitions on groundwater pumping in the area of NE-111 1

These specific long-term stewardship recommendations will also be summarized in the Rocky Flats Long-Term Stewardship Strategy. No engineered controls, environmental monitoring, or physical controls (e.g., fences) are recommended as a result of the conditions remaining at NE-111 1.

NE-111 1 will be evaluated as part of the Sitewide Comprehensive Risk Assessment (CRA), which is part of the RCRA Facility Investigation/Remedial Investigation (RFI/RI) and Corrective Measures Study/Feasibility Study (CMS/FS) that will be conducted for the Site. The need for and extent of any, more general, long-term stewardship activities will also be analyzed in RFI/RI and CMS/FS and will be proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in CAD/ROD, in any post-closure Colorado Hazardous Waste Act (CHWA) permit that may be required, and in any post-RFCA agreement.

Action/No Further Accelerated Action Recommendation

The Subsurface Soil Risk Screen and RFCA soil ALs were applied to the buried soil that is enveloped in a geotextile filter in this PAC. Uranium-238 is the only analyte whose concentration in the soil exceeds the ALs, and it exceeds the uranium-238 AL in only one sample (and only by 2%). Furthermore, Trench T-4 is not in an area prone to landslides where the soil could become exposed at the surface in the future, and there is a downgradient groundwater collection and treatment system to capture contamination, if any, that may be released at Trench T-4. There is no potential for surface water standards to be exceeded at a point of compliance (POC) because of the downgradient groundwater system and the insignificance of erosion as a contaminant transport pathway. Accordingly, removal of the buried soil in Trench T-4 is not required.

DOE received concurrence of NFAA status for PAC NE-111 1 on July 12, 2003 (S H Gunderson, T Rehder letter, to J Legare, 2003).

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, Colorado, June

DOE, 1997, Annual Update for the Historical Release Report for the Rocky Flats Plant, Golden, Colorado, September

DOE, EPA, and CDPHE, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

PAC REFERENCE NUMBER: NE-111.4

IHSS Number 111 4

Operable Unit Buffer Zone

IHSS Group NE-1

Unit Name Trench T-7

Approximate Location N750,000, E2,087,500

Date(s) of Operation or Occurrence

The exact dates of operation are unknown, except for the period of July 29, 1954, through August 14, 1968

Description of Operation or Occurrence

Trench T-7 is located approximately 1,400 feet east of the inner east guard gate and 290 feet south of the East Access Road. It is part of several trenches referred to as the East Trenches (T-3 through T-11, PACs NE-110 and 111 1 through 111 8) (DOE 1992). The trenches were used primarily for the disposal of sanitary wastewater treatment plant sludge. Flattened empty drums and asphalt planking from the SEP, both of which may be potentially contaminated with uranium and plutonium, also may have been disposed in the trenches. In addition, it is believed that water and lathe coolant generated in Building 444 was disposed in one of the East Trenches. Waste disposal in the trenches occurred between July 29, 1954, and August 14, 1968, however, the exact dates are unknown. No documentation has been found that records the time frame during which any particular trench was receiving waste.

Trench T-7 is approximately 115 feet long, 14 to 16 feet wide and 12 feet in depth (i.e., 10 feet of waste material plus 2 feet of soil cover). The volume of waste material in the trench is estimated to be 798 cubic yards (yd³).

Physical/Chemical Description of Constituents Released

Some uranium and plutonium contamination is present in the sludge disposed in the trenches. It is reported that the older sludge would have had primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination. Total long-lived alpha activity present in the sludge was reported between a minimum of 382 pCi/g in August 1964 to a maximum of 3,591 pCi/g in June 1960. Uranium contamination may also be present in flattened drums that may have been

disposed in any of Trenches T-2 through T-11 following burning of the contaminated oils that had been held in the drums. Burning of the contaminated oils had been done in Oil Burn Pit No 2 (PAC 900-153) from March 1957 to mid-1965, and not in the trenches. These flattened drums, estimated at up to 300 total, could be present in any of Trenches T-3 through T-11.

On at least one occasion it is believed that 2,400 gallons of water and lathe coolant generated in Building 444 was also disposed in one of the East Trenches. This waste had an average activity of 150,000 disintegrations per minute per liter (dpm/L). It is believed that this is total alpha activity. The activity of this material was reported as 1.35×10^8 disintegrations per minute (dpm) with approximately 1.3 kilograms (kg) of depleted uranium present in the waste. It is unknown whether this material was in drums.

Responses to Operation or Occurrence

Soil samples were collected from Trench T-7 and the results reported in the Trenches and Mound Site Characterization Report (DOE 1996). The Contaminants of concern identified included plutonium, americium, uranium, metals, and VOCs.

Fate of Constituents Released to Environment

RFCA WRW soil ALs and an integrated risk-based approach (application of the Subsurface Soil Risk Screen) for evaluating the need for, or extent of accelerated actions at PACs were used to determine whether a NFAA determination is justified.

Application of the Subsurface Soil Risk Screen

Screen 1 – Are COC concentrations below Table 3 WRW soil action levels?

No. Three boreholes (11895, 12095, and 11995) were drilled into the trench, and six other boreholes were drilled surrounding the trench. Figure 2.1 shows analytical results greater than background means plus two standard deviations or detection limits. None of the samples collected from the boreholes surrounding the trench contained COC concentrations that exceed the soil ALs. Only two samples from the three boreholes that penetrated the trench contain Contaminants of concern that exceed background and the ALs. These are the 3 to 5 foot interval samples from boreholes 11895 and 12095 (Figure 2.1). They contain plutonium and americium at concentrations that exceed their respective ALs. All of the plutonium data for the three boreholes that penetrated the trench are summarized in Table 2.2.

Table 2.2
Plutonium Concentrations in Trench T-7 Waste

Borehole	Depth Interval (ft)	Plutonium Concentration (nCi/g)
11895	3-5	1,486
11895	8-10	0 01875
11995	3-8	0 03826
11995	8-10	0 01997
12095	3-5	2,450
12095	8-10	0 4501

Screen 2 – Is there potential for subsurface soil to become surface soil?

No Trench T-7 is not in an area prone to landslide, as shown in RFCA, Attachment 5, Figure 1

Screen 3 – Does subsurface soil radiological contamination exceed criteria in Section 5.3 and Attachment 14?

No ALF Section 5 3(C)(2) requires the removal of soil in the 3- to 6-foot depth interval that contains plutonium at concentrations that exceed 3 nanocuries per gram (nCi/g) with an areal extent of contamination that exceeds 80 square meters (m²) As shown in Table 2 2, plutonium concentrations do not exceed 3 nCi/g in any of the Trench T-7 waste samples

Screen 4 – Is there an environmental pathway and sufficient quantity of COC that would cause exceedance of surface water standards (SWS)?

No Contaminant migration via erosion and groundwater are the two possible pathways whereby surface water could become contaminated by Trench T-7 contaminants However erosion is an insignificant pathway because Trench T-7 is in a flat-lying area not prone to erosion, and the waste material is two feet below ground surface (bgs) (HRR [DOE 1992]) Runoff from the area flows into the South Interceptor Ditch (SID), via the East Spray Field Interceptor Channel, and then into Pond C-2 Water from Pond C-2 is monitored prior to discharge

With respect to the groundwater pathway, Trench T-7 is located near a hydraulic divide where water may migrate to the north/northeast or the south/southeast depending on groundwater levels Most of time, wells in the vicinity of Trench T-7 are dry In 1992, there was sufficient groundwater in the area for sampling, and a sample was collected from nearby well 8391 The sample contains VOCs at concentrations greater than RFCA Tier II groundwater ALs, but the concentrations are below RFCA Tier I groundwater ALs as shown in Table 2 3

Table 2.3
Groundwater Concentrations Exceeding Action Levels

Well	Sample Number	Collection Date	Analyte	Result (mg/L)	Detection Limit (mg/L)	Soil AL (mg/kg)
8391	GW034781T	9/3/92	Carbon tetrachloride	0.009	0.0001	0.005
8391	GW034781T	9/3/92	Tetrachloroethene	0.32	0.00014	0.005
8391	GW034781T	9/3/92	Trichloroethene	0.022	0.00028	0.005

Source: DOE 1996

When there is local groundwater and it is flowing to the north/northeast, VOC contamination would be captured by the East Trenches Plume Groundwater Collection and Treatment System. This zero-valence iron treatment system is effective in the removal of VOCs, which were detected in most samples collected from the Trench T-7 site, albeit at concentrations well below the soil ALs. The zero-valence iron treatment system may not be effective in treating plutonium and americium, however, these radionuclides are relatively immobile and do not readily migrate in groundwater.

When there is local groundwater and it is flowing to the south/southeast, any contamination would migrate parallel to the 903 Pad and Ryan's Pit plume. This plume has migrated toward the SID and Woman Creek drainage, however, discharge to surface water has not been observed nor is it expected, most notably due to insufficient saturated thickness and periods of dry conditions (DOE 1999). Additionally, recent groundwater data from two Plume Extent Wells located south and near Trench T-7 (i.e., wells 04591 and 10194) indicate no VOC contamination (DOE 2002). The two wells had uranium-233/234 and uranium-238 concentrations that were above RFCA Tier II groundwater ALs, but the concentrations were below background levels.

Screen 5 – Are COC concentrations above Table 3 Action Levels for ecological receptors?

Yes. One subsurface soil sample from BH4887 had an arsenic concentration of 23 milligrams per kilogram (mg/kg), which just exceeds the AL for ecological receptors of 21.6 mg/kg. Because the concentration is so close to the AL, and no other samples from any borehole at Trench T-7 exceeded the AL for ecological receptors, it is concluded for the NFAA that there is no threat posed to ecological receptors by Trench T-7. However, at this time, ecological ALs are not available for all receptors/chemical combinations (i.e., values are available for only a small subset of chemicals). Screen 5 currently evaluates only this subset; the remainder will be addressed through the ecological risk assessment portion of the CRA.

Stewardship Evaluation

Application of the Subsurface Soil Risk Screen to NE-111.4 indicates NFAA is necessary for protection of public health and the environment. However, because subsurface soil at

this PAC has contaminant concentrations that exceed soil ALs, both near-term and long-term stewardship actions have been recommended

Near-Term Management Recommendations

Near-term recommendations for environmental stewardship include the following

- Excavation at the site will continue to be controlled through the Site Soil Disturbance Permit process
- Site access and security controls will remain in place pending implementation of long-term controls

Long-Term Stewardship Recommendations

Based on remaining environmental conditions at NE-111 4, no specific long-term stewardship activities are recommended beyond the generally applicable Site requirements that may be imposed on this area in the future, which are dependent upon the final remedy selected. Institutional controls that will be used as appropriate for this area include the following

- Prohibitions on construction of buildings,
- Restrictions on excavation or other soil disturbance, and
- Prohibitions on groundwater pumping in the area of NE-111 4

These specific long-term stewardship recommendations will also be summarized in the Rocky Flats Long-Term Stewardship Strategy. No engineered controls, environmental monitoring, or physical controls (e.g., fences) are recommended as a result of the conditions remaining at NE-111 4.

NE-111 4 will be evaluated as part of the Sitewide CRA, which is part of the RFI/RI and CMS/FS that will be conducted for the Site. The need for and extent of any, more general, long-term stewardship activities will also be analyzed in RFI/RI and CMS/FS and will be proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in the CAD/ROD, in any post-closure CHWA permit that may be required, and in any post-RFCA agreement.

Action/No Further Accelerated Action Recommendation

PAC NE-111 4 (Trench T-7) is proposed for NFAA. The Subsurface Soil Risk Screen and RCRA WRW and ecological receptor ALs were applied to this PAC. The Subsurface Soil Risk Screen shows no potential adverse risk to a WRW or ecological receptor. Plutonium is present in the buried waste at a maximum concentration of 2.45

nCi/g, which is below the 3 nCi/g limit that triggers further evaluation and potential soil removal. There is little potential for contaminated runoff because the site is located in a relatively flat area and the waste is buried. The dry conditions at Trench T-7 will substantially limit contaminant migration via groundwater. When groundwater is present, contaminants migrating to the north will be captured by the East Trenches plume treatment system. VOC contamination immediately south of Trench T-7 has not been observed, however, should contaminants migrate in this direction, degradation is expected to prevent discharge of these contaminants to surface water. Therefore, NFAA is required.

DOE received concurrence of NFAA status for PAC NE-111 4 on July 12, 2003 (S H Gunderson, T Rehder letter, to J Legare, 2003)

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, Colorado, June

DOE, 1996, Trenches and Mound Site Characterization Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, 1999, 903 Pad/Ryan's Pit Plume Project Completion Report, Fiscal Year 1999, Rocky Flats Environmental Technology Site, RF/RMRS-99-424 UN, August 30

DOE, 2002, Final RFCA Annual Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, November

PAC REFERENCE NUMBER: NE-216.2 AND NE-216.3

IHSS Number	NA
Operable Unit	Buffer Zone
IHSS Group	NE/NW
Unit Name	East Spray Fields (Center and South)
Approximate Location	N750,000, E2,089,000

Date(s) of Operation or Occurrence

The general dates of operation for the East Spray Fields (center and south) were from 1979 to 1990. For specific portions of the East Spray Fields the dates of operation were

- PAC NE-216 2 – Center area 1979 to the early 1980s, and
- PAC NE-216 3 – South area early 1980s to 1990

Description of Operation or Occurrence

IHSS 216 2 (PAC NE-216 2) is located immediately north of the East Access Road and was only operated for a few years until it was closed due to erosion and soil slumping problems on hillsides near the spray field. IHSS 216 3 (PAC NE-216 3) was a considerably larger spray field located immediately south of the East Access Road and was operated for a period of approximately 10 years.

Spray irrigation of Pond B-3 water was initiated in 1979 as an action to achieve zero off-site discharge of sanitary effluent from the Rocky Flats Plant. Water from Pond B-3, which receives treated sanitary wastewater flows, was applied to these spray fields. This activity was allowed in the National Pollutant Discharge Elimination System (NPDES) Permit of May 1981.

For spray irrigation at the East Spray Fields, water was pumped from Pond B-3 and spray irrigated on the nearby land. Gasoline-driven pumps and a series of laterals and sprinkler nozzles distributed the water to the ground surface for evaporation and infiltration into the subsurface. It is estimated that during spray irrigation activities, up to 20 million gallons per year of water was disposed in this manner. When used, the spray system often saturated the soil near the spray fields, leading to overland flow of the sprayed effluent into the detention ponds.

Direct runoff of spray-irrigated water from the southern portion of the East Spray Field into Woman Creek was observed on March 2, 1987. The direct runoff constituted a technical NPDES violation because the point of discharge to Woman Creek was not an NPDES-permitted discharge point. A second incident occurred following a spill of chromic acid in Building 444 on February 22, 1989. This chromic acid was inadvertently pumped to the sanitary sewer system and it was estimated that 4.7 pounds of chromium was discharged to Pond B-3. The water from this pond was then spray-irrigated on the north and south portions of the East Spray Fields. Some of the runoff from the north portion of the East Spray Field was collected in Pond B-5, requiring the submittal of a RCRA Contingency Plan Implementation Report (CPIR) Number 89-001.

Physical/Chemical Description of Constituents Released

(1997 Annual HRR Update [DOE 1997])

The analyses of treated sanitary effluent discharged to Pond B-3 and actual analysis of the pond water are representative of the water applied to the East Spray Fields. The analytical data for treated sanitary effluent discharges to Pond B-3 are presented on a quarterly basis in the Rocky Flats Environmental Technology Site Quarterly Environmental Monitoring Report. The chemical analytes for selected data are presented in these reports consist of pH, five-day biochemical oxygen demand, total suspended solids, nitrate as nitrogen, total chromium, total phosphorous, total residual chlorine, fecal coliform, and, in more recent years, oil and grease. Dates of application and volumes of water applied to the East Spray Fields are maintained by the Rocky Flats Utilities Department.

Responses to Operation or Occurrence

In response to the NPDES technical violation of March 2, 1987, a ditch was constructed to divert runoff waters from the southern portion of the East Spray Field into Pond C-2. Pond C-2 is an NPDES-permitted discharge point.

In response to the application of water potentially contaminated with chromium to the northern and southern portions of the East Spray Fields, 34 soil samples were collected from the spray fields. Two of the samples were duplicates. The samples were collected from the ground surface, 0 to 1-inch depth, and from the 6- to 7-inch depth. Samples were analyzed for total chromium using the EPA Extraction Procedure (EP) Toxicity test in order to measure the amount of chromium that is leachable from the soil. Sampling locations were representative of the application, surface runoff, and background areas. The EP Toxicity chromium analyses of these soil samples indicated that background soil concentrations of leachable chromium varied from <0.010 to 0.023 milligrams per liter (mg/L), whereas the spray field soil had leachable chromium concentrations of <0.010 to 0.082 mg/L.

Spray field operation ceased in the spring of 1990 because of concerns over the validity of spray irrigation as a water control technique, possible interactions of the spray field with old

waste disposal sites, and uncertainty over the definition of spray irrigation as a "good engineering practice," as specified in the Plant's NPDES permit

Based on historical information regarding NE-216 2 and NE-216 3, previous sampling data, and sampling performed in accordance with Buffer Zone Sampling and Analysis Plan (BZSAP) Addendum #BZ-02-01 (DOE 2002), the following potential contaminants of concern (PCOCs) were targeted, metals, radionuclides, semivolatile organic compounds (SVOCs), VOCs, polychlorinated biphenyls (PCBs), and pesticides

Fate of Constituents Released to Environment

No documents were found that detailed the fate of constituents released to the environment

Action/No Further Accelerated Action Recommendation

Analytical data from IHSS 216 2 and IHSS 216 3 have been reviewed independently of the original Area of Concern (AOC), which included the East Trenches, the Mound, 903 Pad and associated 903 Lip Area, as geographically grouped in the OU 2 Phase II RCRA Facility RFI/RI Report. Analytical data for surficial soil show that contaminants associated with spray evaporation in IHSSs 216 2 and 216 3 pose no significant risk. Following the chromium release, 34 surficial soil samples were collected from the two spray fields. The results from this sampling show that chromium concentrations in surface soil were well below remediation goals. IHSS 216 2 and 216 3 do not warrant further investigation and are proposed for (NFAA)

NFAA for IHSS Group NE/NW is warranted because surface soil PCOCs are less than RFCA ALs and the results of the Subsurface Soil Risk Screen (SSRS) identified in Figure 3 in Attachment 5 of the RFCA Modification (DOE et al 2003, DOE 2003)

No long-term stewardship activities are recommended for IHSSs NE-216 2 and NE-216 3 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSSs NE-216 2 and NE-216 3. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSSs NE-216 2 and NE-216 3.

DOE proposed that NFAA is required for IHSS Group NE/NW on August 11, 2003 (J A Legare, letter, to T Rehder, 2003). The NFAA is pending regulatory agency approval.

Comments

(1997 Annual HRR Update [DOE 1997])

It should be noted that groundwater contamination has been identified in areas east of the 903 Pad (IHSS 112), the Mound (IHSS 113), and East Trenches. Groundwater contamination is known to exist under the East Spray Fields and will be remediated as a separate action.

References

DOE, 1997, Annual Update for the Historical Release Report, Rocky Flats Plant, Golden, Colorado, September

DOE, 2002, Buffer Zone Sampling and Analysis Plan Addendum #BZ-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, March

DOE, 2003, Data Summary Report for IHSS Group NE/NW, Rocky Flats Environmental Technology Site, Golden, Colorado, August

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Legare, J A , letter, to T Rehder, 2003, August 11

PAC REFERENCE NUMBER: NE-1407

IHSS Number	Not Applicable
Operable Unit	Buffer Zone
IHSS Group	NE/NW
Unit Name	OU 2 Treatment Facility
Approximate Location	N749,900, E2,087,000

Date(s) of Operation or Occurrence

The OU 2 treatment system has been in operation from May 1991 to the present A spill occurred on Tuesday, March 9, 1993, at 3 10 p m

Description of Operation or Occurrence

Approximately 50 gallons of separately collected seepage/spring water that would otherwise flow into South Walnut Creek leaked The leak occurred from a ruptured elbow in a secondary containment line as the water was pumped to the OU 2 treatment facility An employee of Reidel Environmental Services discovered the release in response to an alarm signaling that the release had occurred

The leaked water was treated in a chemical precipitation/microfiltration/granular-activated carbon system as part of an IM/IRA being implemented at OU 2

Physical/Chemical Description of Constituents Released

(Quarter #4 HRR Update [DOE 1997])

The analytical results of 56 sampling events performed from May 29, 1991, to February 13, 1992, indicated that the subject influent contained the following F001 listed hazardous waste constituents carbon tetrachloride, trichloroethane and tetrachloroethane Chromium and 1,2-dichloroethene were also found, but at levels below those of a Toxicity Characteristic Leaching Procedure (TCLP) RCRA-regulated hazardous waste The level of contamination was slightly above drinking water standards

Responses to Operation or Occurrence

The pump was turned off immediately after the leak was discovered Soil within the spill area was diked to limit the area of the release to 150 square feet Reidel personnel

notified the Rocky Flats Plant Shift Superintendent and the DOE Shift Duty Officer who arrived at the spill area within two hours of the occurrence. Reidel personnel, wearing protective clothing, repaired the pipeline and resumed Plant operation within three hours. Before the pump was re-energized, Colorado Department of Health (CDH) and EPA Region VIII were notified.

Based on historical information regarding NE-1407, previous sampling data, and sampling performed in accordance with BZSAP Addendum #BZ-02-01 (DOE 2002), the following PCOCs were targeted, metals, and VOCs.

Fate of Constituents Released to Environment

(Quarter #4 HRR Update [DOE 1997])

Based on previous analytical results of the contaminated water, the contaminant concentrations in the soil should not pose an unacceptable risk to human health and the environment.

Action/No Further Accelerated Action Recommendation

NFAA for IHSS Group NE/NW is warranted because surface soil PCOCs are less than RFCA ALs and the results of the SSRS identified in Figure 3 in Attachment 5 of the RFCA Modification (DOE et al 2003) (DOE 2003).

No long-term stewardship activities are recommended for IHSS NE-1407 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS NE-1407. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS NE-1407.

DOE proposed that NFAA is required for IHSS Group NE/NW on August 11, 2003 (J A Legare, letter, to T Rehder, 2003). The NFAA is pending regulatory agency approval.

Comments

(Quarter #4 HRR Update [DOE 1997])

A release notification to the National Response Center was not required because analytical data were available and a reportable quantity of the F-listed constituents was not released.

References

DOE, 1997, Quarter #4 Historical Release Report Update, Rocky Flats Plant, Golden, Colorado, September

DOE, 2002, Buffer Zone Sampling and Analysis Plan Addendum #BZ-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, March

DOE, CDPHE and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2003, Data Summary Report for IHSS Group NE/NW, Rocky Flats Environmental Technology Site, Golden, Colorado, August

Legare, J A , letter, to T Rehder, 2003, August 11

PAC REFERENCE NUMBERS: NE-1412 & NE-1413

IHSS Number	Not Applicable
Operable Unit	Buffer Zone (Former Operable Unit 2)
IHSS Group	NE/NW
Unit Name	Trenches T-12 and T-13 Located in Operable Unit 2, East Trenches
Approximate Location	N 750,000, E 2,087,000

Date(s) of Operation or Occurrence

The exact dates of operation for the East Trenches are not well documented with exception of the overall period of use from July 29, 1954, through August 14, 1968 (DOE 1992) Trench T-12 (PAC NE-1412) was clearly open in a July 2, 1955 photograph but was covered by asphalt due to roadwork as part of the East Access road south bypass Aerial photographs show that Trench T-13 (PAC NE-1413) was open between 1966 and 1967 but entirely covered by asphalt in 1968 when the East Access road north bypass was constructed

Description of Operation or Occurrence

Trenches T-12 and T-13 were identified and incorporated into the RI for OU 2 (East Trenches) in June of 1993 (DOE 1993) when a plant employee completed further research of aerial photographs in the East Trench area (EG&G 1992)

Trench T-12 (PAC NE-1412) was identified on a July 2, 1955 photograph The trench was covered with asphalt during construction of the East Access road south bypass in 1964 Historical documentation indicates that the East Trenches were primarily used to dispose of sanitary wastewater and sludge from the sewage treatment plant drying beds (Building 995) until August of 1968 From 1968 to 1970, sanitary wastewater and sludge was taken to the Present Landfill (IHSS 114) The total amount of sludge disposed of in the East Trenches has been estimated to be 125,000 kilograms (275,577 lbs)

Trench T-13 (PAC NE-1413) is visible only in vertical aerial photographs taken on April 15, 1966, and April 29, 1967 and is now covered by the East Access road north bypass Trench T-13 is estimated to be nearly 250 feet in length and was filled with dark gray material An employee was contacted who remembers that this trench may also have contained laboratory wastes

In general, the East Trenches are documented as being approximately 10 feet deep with several feet of soil cover

Physical/Chemical Description of Constituents Released

Some uranium and plutonium contamination is known to be present in the sewage sludge. This occurred because in the early years some of the floor drains in production buildings were not isolated from the Sewage Treatment Plant. Because of a change made to the primary weapon component produced at Rocky Flats, older sludges (mid to late 1950s) could be contaminated with uranium while newer sludge would have increasing amounts of plutonium contamination. Total long-lived alpha activity present in the sludge was reported from a minimum of 382 pCi/g in August of 1964 to a maximum of 3,591 pCi/g in June of 1960. Uranium contamination may also be present in flattened drums that may have been disposed of in any of the trenches following burning of the contaminated oils that had been in the drums (refer to the Oil Burn Pit #2, IHSS 153). Flattened drums, estimated to be as many as 300 total, could be present in any of the trenches. On at least one occasion, it is believed that 2,400 gallons of lathe coolant generated in Building 444 were also disposed of in one of the trenches. This waste had an average activity of 150,000 dpm/L (presumed total alpha activity).

Responses to Operation or Occurrence

Upon discovery of the two trenches, information was incorporated into the RI for OU 2 in 1993 (DOE 1993). The area was again studied in detail in the summer of 1995 where EM-31 and 61 surveys, Ground Penetrating Radar (GPR) surveys and borehole sampling was conducted. Results from the study are documented in the Draft Trenches and Mound Site Characterization Report (DOE 1996). The draft report is misleading with respect to the location of Trench T-12 (NE-1412) where it has been moved from its first documented location to an area immediately adjacent to Trench T-9 (IHSS 111 6) on the western side. It is important to note that this has been corrected within geographic information system (GIS) Trench coverages. Further, this Annual Update to the HRR has created a Trench T-9a and T-9b (IHSSs 111 6a and 111 6b) to capture what does appear to be a second Trench (see Plate 1) within the original IHSS 111 6 boundary.

Trenches T-12 and T-13 were sampled in the summer of 2003 as part of the NE/NW Group characterization in accordance with the BZSAP Addendum #BZ-02-01 (DOE 2002).

Fate of Constituents Released to Environment

Based upon the characterization sampling results presented in the Data Summary Report for IHSS Group NE/NW (DOE 2003), there does not appear to be any actual or potential risk to human health or the environment. There were no analytical results above the RFCA WRW ALs. However, two surface locations were identified with plutonium concentrations above WRW ALs. Both locations are adjacent to the south side of Trench T-12 and were 133 pCi/g and 88 pCi/g. It is agreed that these locations will be addressed

within the 903 Pad Lip area remediation project for IHSS 155 and are not associated with the trench histories. One surface location immediately east of Trench T-13 and next to the East Access road had a lead concentration of 74 mg/kg, which is above the Ecological Receptor AL. This concentration of lead is typical of an area adjacent to highly traveled road and there are no pathways to surface water.

Action/No Further Accelerated Action Recommendation

Based on the results of the soil samples collected in accordance with BZSAP Addendum #BZ-02-01 (DOE 2002), no current or potential contaminant source was identified for either Trench T-12 or T-13 therefore, NFAA was proposed as part of IHSS Group NE/NW (DOE 2003). Detections of surface plutonium are attributable to the 903 Pad Lip area and will be addressed in the current 903 Lip Area project. Lead concentrations exceeded ecological receptor ALs at one surface soil location. This is attributed to heavy traffic for many years along the East Access Road North Bypass. There were no other PCOCs detected at concentrations greater than RFCA WRW or Ecological Receptor ALs.

DOE proposed that NFAA is required for IHSS Group NE/NW on August 11, 2003 (J A Legare, letter, to T Rehder, 2003). The NFAA is pending regulatory agency approval.

Comments

While reviewing aerial photographs and the Tenth Quarterly Update to the HRR dated January 1995 (DOE 1995), an error was identified in the 1995 Quarterly Report. Specifically the 1995 PAC map shows Trench T-12 (PAC NE-1412) to be under the East Access Road North Bypass and Trench T-13 (PAC NE-1413) to be under the South bypass. The opposite is true and the maps have been corrected (see Plate 4).

References

EG&G, 1992, A Sieben letter, T Moore, Additional Research Conducted in the East Trench Area, July 30

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 1993, Phase I Remedial Investigation OU 2 (East Trenches), Rocky Flats Plant, Golden, Colorado, December

DOE, 1995, Tenth Quarterly Update to the Historical Release Report, Rocky Flats Plant, Golden, Colorado, January

DOE, 1996, Draft Trenches and Mound Site Characterization Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, 2002, Buffer Zone Sampling and Analysis Plan Fiscal Year 2002, Addendum #BZ-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2003, Data Summary Report for IHSS Group NE/NW, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, CDPHE and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Legare, J A , letter to T Rehder, August 11, 2003

PAC REFERENCE NUMBER: NW-174A

IHSS Number 174A

Operable Unit Buffer Zone

IHSS Group NE/NW

Unit Name Property Utilization & Disposal Drum Storage Facility

Approximate Location N752,000, E2,082,000

Date(s) of Operation or Occurrence

1974 - 1994

Description of Operation or Occurrence

(1998 Annual HRR Update [DOE 1998])

Two areas within the Property Utilization & Disposal (PU&D) storage yard (PAC NW-170) were specified for container storage. One area stored drums (PAC NW-174a) and the other was designated for a dumpster (PAC NW-174b). Until August 1985, the drum storage area was used for the storage of RCRA-regulated waste. Since then, it has been used for the storage of empty drums. All drums were externally monitored for radiation prior to shipment to the PU&D Yard. The contents of any drums originating from areas that handled radioactive materials were sampled and analyzed prior to shipment to the PU&D Yard. At times, the level of radioactivity set for acceptance in the Yard was exceeded and drums were returned to their building of origin. Dumpsters were located at buildings and moved to the storage area when filled. Both the dumpster and the drums were stored directly on the ground surface. Material was stored in these areas prior to shipment for off-site recycling.

An incident in May 1982 identified two drums of liquid stored in the PU&D storage area as being pressurized with bulging drum heads. A third drum was noted to have exploded with the bottom blown out. No documentation was found that indicated a release to the environment as a result of these damaged drums. No other documentation was found describing other releases to the environment.

Physical/Chemical Description of Constituents Released

The drums held waste oils that contained hazardous constituents, waste paints, and spent paint thinner. Waste oils were typically derived from equipment and vehicle maintenance.

activities The dumpster storage area was for the storage of stainless steel chips coated with freon-based or oil-based lathe coolant

The dumpster contained stainless steel chips coated with lathe coolant The lathe coolant was either freon-based or oil-based Radioactive contamination of the chips should not have been present due to the presence of administrative controls at the Rocky Flats Plant (RFP) to prevent radioactively contaminated material from being shipped to the yard

Visible staining was apparent on the soil in the dumpster storage area from spills that occurred during transfer and from rainwater washing residual oil from metal shavings onto the ground This area was monitored and soil and water samples were collected to identify the extent of contamination

Responses to Operation or Occurrence

Visual monitoring of the drum and dumpster storage areas was conducted periodically Although visible staining on the ground surface was documented in the drum storage area, no documentation for leaks or spills was found Soil and water samples are to be collected to identify the extent of contamination in the area

The drums involved in the May 1982 incident were moved to the hazardous waste storage area (PAC NW-203) west of the Present Landfill and the contents identified It is presumed that the drums were located in the drum storage area of the PU&D storage facility

Assessment of environmental contamination attributable to PU&D Yard operations was initiated in accordance with the IAG as part of OU 10 as well as a separate, preremedial investigation

Based on historical information regarding NE-174a, previous sampling data, and sampling performed in accordance with BZSAP Addendum #BZ-02-01 (DOE 2002), the following PCOCs were targeted metals, radionuclides, SVOCs, VOCs, PCBs, and pesticides

Fate of Constituents Released to Environment

In 1994, approximately 235 soil gas locations were sampled for VOC analysis and 71 surface soil locations were sampled and analyzed for metals, SVOCs, pesticides, and PCBs The data indicated that VOCs were potentially present in subsurface soil along the eastern third of the yard

A preremedial investigation of IHSSs 170, 174a, and 174b was conducted in August 1997 Characterization of the PU&D Yard was conducted to investigate the potential presence of a VOC contaminant source capable of impacting groundwater The investigation consisted of 20 soil borings and 38 subsurface soil samples analyzed for VOCs In most cases, the borehole locations correspond with the areas where VOC detections in soil gas samples were observed in the 1994 survey Borehole locations

associated with IHSS 174a were placed within the IHSS boundary and immediately northwest where VOC detections in soil gas were observed

In accordance with BZSAP Addendum BZ-02-01 (DOE 2002), one additional sample was collected to the north of IHSS 174a

Action/No Further Accelerated Action Recommendation

Based on the subsurface soil sampling data, residual tetrachlorethene contamination is observed in IHSS 174a and has likely contributed to the degradation of groundwater in the vicinity of the IHSS. However, the concentrations observed in the seven boreholes placed in the area do not equal or exceed RFCA Tier I subsurface soil ALs indicating that an appreciable source of contamination to groundwater does not remain

NFAA for IHSS Group NE/NW is warranted because surface soil PCOCs are less than RFCA ALs and the results of the SSRS identified in Figure 3 in Attachment 5 of the RFCA Modification (DOE et al 2003, DOE 2003)

DOE proposed that NFAA is necessary for Group NE/NW on August 11, 2003 (J A Legare, letter, to T Rehder, 2003). The NFAA is pending regulatory agency approval

Comments

(1998 Annual HRR Update [DOE 1998])

A release notification to the National Response Center was not required because analytical data were available and a reportable quantity of the F-listed constituents was not released

References

DOE, 1998, Annual Update for the Historical Release Report, Rocky Flats Plant, Golden, Colorado, September

DOE, 2002, Buffer Zone Sampling and Analysis Plan Addendum #BZ-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, March

DOE, CDPHE and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2003, Data Summary Report for IHSS Group NE/NW, Rocky Flats Environmental Technology Site, Golden, Colorado, August

Legare, J A, letter to T Rehder, August 11, 2003

**PAC REFERENCE NUMBER: SW-133.1, SW-133.2, SW-133.4, AND SW-1702
(ASH PITS)**

IHSS Numbers	SW-133 1, SW-133 2, SW-133 4, and PAC SW-1702
Operable Unit	Buffer Zone
IHSS Group	SW-1
Unit Name	Ash Pits
Approximate Location	N748,000, E2,080,000

Date(s) of Operation or Occurrence

1950s - 1968

Description of Operation or Occurrence

In 1970, four burial sites (trenches [SW-133 1, SW-133 2, SW-133 3, and SW-133 4]) were located south of the incinerator area (IHSS 133 5). These trenches were used for disposal of ash (and noncombustible trash) from the incinerator that operated from approximately 1952 until 1968. Noncombustible trash, such as counting discs, broken glassware, and metal, was collected in a nearby dumpster and later disposed of in the trenches. The trenches are approximately 150 to 200 feet long, 12 feet wide, and 10 feet deep, and have been staked with steel fence posts and surveyed. Approximately 3 feet of soil covers each trench location. Two additional burial trenches (PAC SW-1701 and PAC SW-1702) were identified in 1994 (DOE 1996) based on anomalies found during a time-domain electromagnetic (TDEM) conductivity survey. These two additional areas were confirmed through review of aerial photographs and samples collected from boreholes in the immediate area (Figure 2.2). In addition, two anomalies adjacent to Ash Pits 2 and 4 (IHSSs 133 2 and IHSS 133 4, respectively) were identified based on the TDEM conductivity survey. In each case, the southern most anomaly at each location was referred to as a twin investigation area as documented in the OU 5 Final Phase I RFI/RI Report (DOE 1996). The areas are shown on Figure 2.2 and are referred to as the "Ghost Ash Pits."

Ash from the incinerator and "dump area" was monitored in 1959 (DOE 1992). Activities of 4,000 counts per minute (cpm) alpha and 30 millirems per hour (mr/hr) beta were observed. Subsequently, the ash was buried in a trench. Special air sampling of the Plant incinerator was conducted in 1958 to address concerns of burning potentially contaminated waste from Buildings 444 and 447.

Physical/Chemical Description of Constituents Released

In September 1954, five ash samples from the burning of Building 991 wastes were collected. The average activity of the ash was 4.5×10^7 disintegrations per minute per kilogram (dpm/kg) of dry ash. The alpha activity of the ash was approximately 100 times higher than the usual ash samples from the incinerator.

In 1956, special monitoring was performed during and after contaminated waste was burned in the Plant incinerator. Ash samples indicated 1.9 grams of radioactive material (depleted uranium) per kilogram of ash. Smear surveys of the incinerator before and after burning showed no increase in contamination. It was estimated that approximately 30,000 cubic feet of soil and ash were buried in the trenches.

Small quantities of depleted uranium-contaminated combustibles were burned along with the general combustible Plant refuse. One estimate indicates that less than 100 grams of depleted uranium were in the combustibles. A monthly ash sampling program was initiated in January 1962 and indicated there was 1 to 8 kilograms of depleted uranium per ton of ash (DOE 1992).

Responses to Operation or Occurrence

Sampling events were conducted from November 24, 1953, through December 9, 1954. In 1970, the locations of Ash Pits 1-1 through 1-4 were marked in the field. The ash in these trenches was evaluated and considered to present no problems unless disturbed and inhaled.

Fate of Constituents Released to Environment

The 2001 Annual Update for the HRR provides a NFAA determination assessment for all of the Ash Pits (DOE 2001). Based on the data and assessment provided in that update, NFAAs were approved by the regulatory agencies for Ash Pit 3 (SW-133.3) and the Recently Identified Ash Pit (TDEM-1) (SW-1701) (EPA and CDPHE 2002). Analytical data specific to the Ghost Pits were submitted in the 2002 Annual Update for the HRR, which indicates that all data are below Tier II Soil ALs. The regulatory agencies agreed that these areas are not the location of the Ash Pits, and therefore are not PACs, and they have been removed from the maps/plates in the HRR. (The Ghost Pits are shown on Figure 2.2 of this document for thoroughness.) The regulatory agencies determined that additional data needed to be collected to render a NFAA determination for the Incinerator Facility (SW-133.5) and the Concrete Wash Pad (SW-133.6).

Because of modifications to RFCA Attachment 5, specifically, the introduction of new ALs and the integrated risk-based approach (application of the Subsurface Soil Risk Screen), Ash Pit 1 (SW-133.1), Ash Pit 2 (SW-133.2), Ash Pit 4 (SW-133.4), and the Recently Identified Ash Pit (TDEM-2) (SW-1702) have been reassessed to render a

NFAA determination No additional data have been included in the reassessment of these PACs relative to that included in the 2001 Annual Update for the HRR

RFCA ALs are from the modifications to RFCA Attachment 5, dated June 6, 2003 (DOE et al 2003) Background levels for subsurface soil and groundwater (total concentrations for the Upper Hydrostratigraphic Unit) are from the Background Geochemical Characterization Report (DOE 1993a) Background values for surface soil and sediments are from Geochemical Characterization of Background Surface Soils Background Soils Characterization Program (DOE 1995) All background values used for comparison are the mean background value plus two standard deviations Table 2 4 lists the trenches and associated boreholes and/or wells

Table 2.4
Subsurface Soil Sampling Locations for Ash Pits

USSTAC Number	Borehole Location
133 1	56293, 56393, 56493, 58893
133 2	56893, 56993, 57093, 57294
133 4	55694, 55893, 55993, 56093
SW-1702	55894, 55994, 56094

Surface Soil Assessment

Results from analysis of 18 surface soil and sediment samples from across the ash pit area indicate, with the exception of arsenic and beryllium, the metals are not at concentrations exceeding the 1996 Tier II ALs Of the arsenic and beryllium results, only one sample (a sediment sample) had a concentration exceeding background (arsenic at 17 3 mg/kg, background is 13 1 mg/kg) This one exceedance above background is below the WRW-based AL of 21 6 mg/kg In addition to laboratory analysis for radionuclides, a High-Purity Germanium (HPGe) survey of the entire area was conducted in 1993 (DOE 1993b) Figures 2 3, 2 4, and 2 5 show the survey results for americium-241, uranium-235, and uranium-238 Americium was not detected at statistically significant levels This result suggests the absence of plutonium Activities of the uranium isotopes were all well below the ALs Consequently, excavation of surface soil is not required

Application of the Soil Risk Screen For Subsurface Soil

Screen 1 – Are COC concentrations below Table 3 WRW Soil Action Levels?

No As shown in Tables 2 5 through 2 8 and Figures 2 6a through 2 6d, concentrations of uranium isotopes and a few metals in pit material buried to a depth of approximately 3 feet exceed the ALs as follows

SW-133.1 – Uranium-235 and uranium-238 (Table 2 5)

SW-133.2 – Chromium, uranium-235 and uranium-238 (Table 2 6)

SW-133.4 – Uranium-235 and uranium-238 (Table 2 7)

SW-1702 – Chromium, lead, and all of the uranium isotopes (Table 2 8)

Table 2.5
Summary of Analytical Results for Subsurface Soil at SW-133.1

Analyte	Samples Above Detection Limit	Maximum Concentration	Units	Average Concentration	Action Level	Background Concentration
Aluminum	11	24300	mg/kg	9820.9	228000	35373.2
Americium-241	1	1	pCi/g	1	76/1900**	0.02
Antimony	2	33	mg/kg	26.5	409	17.0
Arsenic	11	14	mg/kg	3.5	22.2/21.6**	13
Barium	11	374	mg/kg	159.7	26400	289.4
Beryllium	7	4	mg/kg	1.4	921/215**	14.2
Cadmium	3	57	mg/kg	20.7	962	1.7
Calcium	11	24600	mg/kg	7166.4		39382.3
Cesium	1	13	mg/kg	13.0		
Chromium	11	41	mg/kg	11.5	268	68.3
Cobalt	11	37	mg/kg	11.0	1550	29.0
Copper	11	2920	mg/kg	298.6	40900	38.2
Gross Alpha	12	742	pCi/g	78.9		43.5
Gross Beta	12	1580	pCi/g	171.0		36.8
Iron	11	31100	mg/kg	13932.7	307000	41046.5
Lead	11	260	mg/kg	52.2	1000/25.6**	25.0
Lithium	11	8	mg/kg	5.0	20400	34.7
Magnesium	11	4670	mg/kg	2595.5		9315.4
Manganese	11	696	mg/kg	228.5	3480	901.6
Molybdenum	1	24	mg/kg	24.0	5110	25.6
Nickel	10	66	mg/kg	21.3	20400	62.2
Plutonium-239/240	1	1	pCi/g	1	50	0.02
Potassium	11	1680	mg/kg	986.5		6196.8
Silver	3	158	mg/kg	57.3	5110	24.5
Sodium	11	741	mg/kg	394.7		1251.2
Strontium	11	96	mg/kg	52.7	613000	211.4
Thallium	1	1	mg/kg	1		1.8
Tin	1	16	mg/kg	16.0	613000	286.3
Uranium-234	13	127	pCi/g	20.8	300/1800**	2.6
Uranium-235						
Uranium-238						
Vanadium	11	58	mg/kg	24.4	7150/433**	88.49
Zinc	11	891	mg/kg	136.4	307000	139.1

Max Conc Above Background

Max Conc Above Action Level

* Subsurface soil samples were analyzed for Target Analyte List (TAL) metals, gross alpha and beta, uranium-233,234, uranium-235, uranium-238, americium-241, and plutonium-239,240. Analytes shown are only those that were detected. The average concentrations are computed from the detected values only.

**AL for protection of WRW/AL for protection of ecological receptor

Table 2.6
Summary of Analytical Results for Subsurface Soil at SW-133.2

Analyte	Number of Samples Above Detection Limit	Maximum Concentration	Unit	Average Concentration	300000	35373 17
Aluminum	20	17400	mg/kg	11396 33	228000	35373 17
Americium-241	19	1.169	pCi/g	0.114233474	76	0.02
Antimony	3	149	mg/kg	55.23333333	409	16.97
Arsenic	20	24.3	mg/kg	4.59	22.2	13.14
Barium	20	414	mg/kg	164.3	26400	289.38
Beryllium	11	131	mg/kg	22.49636364	921	14.20
Cadmium	7	64.8	mg/kg	18.27142857	962	1.70
Chromium						
Cobalt	20	67.6	mg/kg	11.895	1550	29.00
Copper	20	1394.3	mg/kg	177.22	40900	38.21
Gross Alpha	20	274	pCi/g	41.37735		43.47
Gross Beta	20	662.5	pCi/g	72.779		36.84
Iron	19	62263.7	mg/kg	19288.61579	307000	41046.52
Lead	14	825	mg/kg	80.89285714	1000	24.97
Lithium	16	14.1	mg/kg	7.74375	20400	34.66
Magnesium	20	4450	mg/kg	2716.315		9315.44
Manganese	20	1260	mg/kg	271.965	3480	901.62
Mercury	4	0.13	mg/kg	0.0875	25200	1.52
Molybdenum	5	470	mg/kg	123.88	5110	25.61
Nickel	20	4750	mg/kg	263.123	20400	62.21
Plutonium-239/240	19	0.9389	pCi/g	0.130267153	50	0.02
Potassium	18	2290	mg/kg	1549.722222		6196.81
Selenium	2	80.8	mg/kg	40.835	5110	4.80
Silver	6	190	mg/kg	58.95	5110	24.54
Sodium	17	1200	mg/kg	283.2529412		1251.24
Strontium	20	54.1	mg/kg	27.945	613000	211.38
Thallium	11	0.39	mg/kg	0.288181818		1.84
Thi	2	36.1	mg/kg	30.25	613000	286.31
Uranium-234	19	105.7	pCi/g	9.296484211	300	2.64
Uranium-235-D						
Uranium-238-D						
Vanadium	20	61.3	mg/kg	35.06	7150	88.49
Zinc	20	1428.3	mg/kg	240.015	307000	139.10
1,2,4-Trichlorobenzene	1	60	ug/kg	60	9230000	
1,2-Dichlorobenzene	1	30	ug/kg	30	31200000	
1,4-Dichlorobenzene	1	10	ug/kg	10	840000	
2-Chlorophenol	1	10	ug/kg	10	5110000	
2-Methylnaphthalene	1	10	ug/kg	10	20400000	

Analyte	Number of Samples Above Detection Limit	Maximum Concentration	Units	Average Concentration	Maximum Concentration	Units
Benzo(a)pyrene	1	10	ug/kg	10	3490	
Bis(2-Ethylhexyl)phthalate	1	80	ug/kg	80	1970000	
Bis(benzyl)phthalate	1	50	ug/kg	50	147000000	
Dibenzofuran	1	10	ug/kg	10	2950000	
Diethylphthalate	1	40	ug/kg	40	590000000	
Di-n-butylphthalate	1	2700	ug/kg	2700	75700000	
Fluoranthene	1	10	ug/kg	10	27200000	
Hexachlorobenzene	1	30	ug/kg	30	17200	
Naphthalene	1	30	ug/kg	30	3090000	
Phenol	1	30	ug/kg	30	613000000	
Pyrene	1	10	ug/kg	10	22100000	



Max Conc Above Background

Max Conc Above Action Level

* Subsurface soil samples were analyzed for TAL metals, gross alpha and beta, uranium-233,234, uranium-235, uranium-238, americium-241, and plutonium-239,240. Analytes shown are only those that were detected. The average concentrations are computed from the detected values only.

**AL for protection of WRW/AL for protection of ecological receptor

Table 2.7
Summary of Analytical Results for Subsurface Soil at SW-133.4

Analyte	Number of Samples above Detection Limit	Maximum Concentration	Unit	Average Concentration	Background Level	Background Level
Aluminum	11	21200	mg/kg	12253.6	228000	35373.2
Antimony	4	28	mg/kg	16.0	409	17.0
Arsenic	11	8	mg/kg	3.9	22.2/21.6**	13.1
Barium	11	637	mg/kg	199.9	26400	289.4
Beryllium	7	4	mg/kg	2.1	921/2.15**	14.2
Cadmium	6	42	mg/kg	18.3	962	1.7
Calcium	11	15100	mg/kg	6572.7		39382.3
Cesium	1	17	mg/kg	17.0		
Chromium	11	62	mg/kg	22.6	268	68.8
Cobalt	11	34	mg/kg	11.5	1550	29.0
Copper	11	2520	mg/kg	609.5	40900	38.2
Gross Alpha	12	363	pCi/g	109.6		43.6
Gross Beta	12	606	pCi/g	172.6		36.8
Iron	11	107000	mg/kg	29549.1	307000	41046.3
Lead	11	935	mg/kg	149.2	1000/25.6**	25.0
Lithium	5	18	mg/kg	11.0	20400	34.7
Magnesium	11	5190	mg/kg	3228.2		9315.4
Manganese	11	998	mg/kg	326.7	3480	901.6
Mercury	1	1	mg/kg	1	25200	1.5
Molybdenum	4	20	mg/kg	13.5	5110	25.6
Nickel	11	93	mg/kg	32.7	20400	62.2
Plutonium-239/240	1	1	pCi/g	1	50	0.02
Potassium	8	2280	mg/kg	1416.1		6196.8
Silicon	3	368	mg/kg	316.0		
Silver	6	311	mg/g	81.7	5110	24.5
Sodium	10	1220	mg/kg	648.2		1251.2
Strontium	11	72	mg/kg	42.7	613000	211.4
Tin	4	579	mg/kg	168.0	613000	286.3
Uranium-234	10	241	pCi/g	50.5	300/1800**	2.6
Uranium-235						
Uranium-238						
Vanadium	11	60	mg/kg	33.0	7150/433**	88.5
Zinc	11	2390	mg/kg	531.2	307000	139.1

Max Conc Above Background

Max Conc Above Action Level

* Subsurface soil samples were analyzed for TAL metals, gross alpha and beta, uranium-233,234, uranium-235, uranium-238, americium-241, and plutonium-239,240. Analytes shown are only those that were detected. The average concentrations are computed from the detected values only.

**AL for protection of WRW/AL for protection of ecological receptor

Table 2.8
Summary of Analytical Results for Subsurface Soil at SW-1702

Analyte	Number of Samples Above Detection Limit	Maximum Concentration	Unit	Average Concentration	Action Level	Background
Aluminum	9	28600	mg/kg	17514.4	228000	35373.1
Americium-241	1	3	pCi/g	3	76/1,900**	0.02
Antimony	2	16	mg/kg	11.5	409	17.0
Arsenic	9	21	mg/kg	10.0	22.2/21.6**	16.4
Barium	9	1680	mg/kg	509.7	26400	289.4
Beryllium	9	446	mg/kg	91.4	92/2,15**	14.2
Calcium	7	71	mg/kg	27.0	962	1.7
Chromium	9	24700	mg/kg	8977.8		39382.3
Cadmium	6	9	mg/kg	6.2		
Chromium						
Cobalt	9	701	mg/kg	148.6	1550	29.0
Copper	9	8850	mg/kg	2081.4	40900	38.2
Gross Alpha	11	418	pCi/g	116.4		45.5
Gross Beta	11	899	pCi/g	276.5		36.8
Iron	9	106000	mg/kg	40500.0	307000	41046.5
Lead						
Lithium	9	14	mg/kg	10.6	20400	34.7
Magnesium	9	11700	mg/kg	4656.7		9315.4
Manganese	9	2150	mg/kg	588.6	3480	901.6
Molybdenum	5	68	mg/kg	34.4	5110	25.6
Nickel	9	325	mg/kg	94.1	20400	62.2
Plutonium-239/240	4	7	pCi/g	3.5	50	0.02
Potassium	9	3950	mg/kg	1734.0		6196.8
Selenium	3	7	mg/kg	5.3	5110	4.8
Silicon	3	704	mg/kg	503.0		
Silver	8	209	mg/kg	74.5	5110	24.5
Sodium	9	3360	mg/kg	1254.1		1251.2
Strontium	9	102	mg/kg	54.1	613000	211.4
Thallium	5	7	mg/kg	3.4		1.8
Tin	7	102	mg/kg	49.6	613000	286.3
Uranium-234						
Uranium-235						
Uranium-238						
Vanadium	9	60	mg/kg	36.2	7150/433**	88.5
Zinc	9	7220	mg/kg	1802.6	30700	139.1

Max Conc Above Background

Max Conc Above Action Level

* Subsurface soil samples were analyzed for TAL metals, gross alpha and beta, uranium-233,234, uranium-235, uranium-238, americium-241, and plutonium-239,240. Analytes shown are only those that were detected. The average concentrations are computed from the detected values only.

**AL for protection of WRW/AL for protection of ecological receptor

Screen 2 – Is there a potential for subsurface soil to become surface soil?

Yes The Ash Pits are located in an area that was mapped as being prone to landslides as shown on RFCA Appendix 5, Figure 1 (DOE et al 2003) Evaluate the accelerated action in accordance with Sections 4 C and 5 C of RFCA and consider any subsequent screens in the evaluation, as appropriate

As noted in Screen 1, the maximum concentrations of uranium isotopes and a few metals exceed the ALs at the Ash Pits However, with the exception of PACs SW-133 2 and SW-1702, the average concentrations are well below the ALs At SW-133 2, the average chromium concentration (429 7 mg/kg) exceeds the AL of 268 mg/kg However, the average concentration is 1/20th of the maximum concentration indicating the maximum chromium concentration is an isolated zone of contamination not representative of the balance of the material present in the PAC At SW-1702, the average concentration of lead (1,223 mg/kg) and uranium-235 (9 7 pCi/g) exceed their respective ALs (1,000 mg/kg and 8 pCi/g) However, these exceedances are relatively small (i e , they are within 20 – 25 percent of the ALs)

Although the Ash Pits are located in an area that has been mapped as a landslide deposit as shown on RFCA Appendix 5, Figure 1 (DOE et al 2003), a visual inspection of the area indicates it has a broad, gently sloping (approximately 8 percent grade) surface, with no evidence of recent landslide activity Also, the area has a well-established vegetative cover, which will minimize erosion from runoff

Because the Ash Pits are near Woman Creek, bank erosion and eventual downcutting into the Ash Pits is another potential mechanism to expose contaminated subsurface soil However, the closest ash pit, SW-133 6 (not under evaluation here), is 80 to 100 feet from the creek Over the past 60 years, there is no discernable bank erosion based on overlaying a relatively recent aerial photo transparency (circa 1992) on a 1937 aerial photo with the same scale Furthermore, the Ash Pits are outside the 100-year floodplain (Figure 2 7)

One final mechanism to be addressed with respect to potential exposure of subsurface contaminated soil is the action of burrowing animals Typically, prairie dogs burrow to depths of approximately 6 feet and thus potentially bring contaminated subsurface soil to the surface However, it must be recognized that the Ash Pits area is relatively small (approximately 20 acres) compared to the human exposure unit sizes being considered for the CRA (on the order of several hundred acres) Accordingly, the incremental impact from this activity is small Furthermore, any soil that would be brought to the surface would be mixed with uncontaminated overlying soil during the burrowing activity

Screen 3 – Does subsurface soil radiological contamination exceed criteria in Section 5.3 and Attachment 14?

No As shown in Tables 2 5 through 2 8, plutonium and americium concentrations are well below the soil ALs of 50 and 76 pCi/g, respectively, and, therefore, further analysis is not required

Some uranium isotopes, as noted in Screen 1, exceed soil ALs, however, approximately 3 feet of uncontaminated to slightly contaminated soil was previously placed over the pit materials This cover sufficiently protects the WRW from direct exposure and eliminates the need for an accelerated action

Screen 4 – Is there an environmental pathway and sufficient quantity of COC that would cause exceedance of surface water standards (SWS)?

No Although a groundwater treatment system is not and will not be in place to intercept groundwater from the Ash Pits, groundwater does not appear to be a significant pathway for COC migration to surface water Current groundwater monitoring does not indicate groundwater contamination in this area, however, the number and location of groundwater wells will be evaluated between now and Site closure

Contaminant migration via erosion and groundwater are the two possible pathways whereby surface water could become contaminated by the Ash Pits The erosion pathway can be eliminated because surface soil is largely uncontaminated in the vicinity of the Ash Pits (see Surface Soil Assessment), and deep erosion is unlikely as discussed in the evaluation presented in Screen 2 However, because groundwater is a possible pathway whereby Woman Creek could become contaminated by the Ash Pits, groundwater chemistry has been evaluated for evidence of contamination Subsequently, Woman Creek surface water quality is assessed

Downgradient Groundwater Quality

Data from wells in the vicinity of the Ash Pits were evaluated to determine whether there is an impact to groundwater Groundwater quality data are summarized in Table 2 9, and discussed with respect to each of the PACs below

Table 2.9
Summary of Analytical Results Above Tier II Action Levels for
Groundwater at the Ash Pits

Location	Collection Date	Contaminant	Result	Unit	ALs Tier I	ALs Tier II	Background	Background
SW-133.1 and SW-133.3								
56294	4/27/95	Thallium	5.9	ug/L	No	Yes	200	2
SW-133.2								
58793	3/7/95	Aluminum	44900.0	ug/L	No	Yes	3.65E+06	3.65E+04
58793	8/12/93	Aluminum	64200.0	ug/L	No	Yes	3.65E+06	3.65E+04
63793	5/1/95	Thallium	4.3	ug/L	No	Yes	200	2
63693	1/18/95	Uranium-233,-234	1.3	pCi/L	No	Yes	106	1.06
63793	1/4/95	Uranium-233,-234	1.4	pCi/L	No	Yes	106	1.06
63793	5/1/95	Uranium-233,-234	4.1	pCi/L	No	Yes	106	1.06
58793	8/12/93	Uranium-238	0.8	pCi/L	No	Yes	76.8	0.768
58793	6/18/93	Uranium-238	1.1	pCi/L	No	Yes	76.8	0.768
58793	1/6/95	Uranium-238	3.6	pCi/L	No	Yes	76.8	0.768
63693	1/18/95	Uranium-238	1.3	pCi/L	No	Yes	76.8	0.768
63793	1/4/95	Uranium-238	1.1	pCi/L	No	Yes	76.8	0.768
63793	5/1/95	Uranium-238	2.9	pCi/L	No	Yes	76.8	0.768
SW-133.4 and SW-1702								
63093	3/30/94	Methylene Chloride	13.0	ug/L	No	Yes	500	5
63093	5/24/95	Uranium-233,-234	3.3	pCi/L	No	Yes	106	1.06
63093	5/24/95	Uranium-238	2.4	pCi/L	No	Yes	76.8	0.768

SW-133.1 (and SW-133.3) - One well, 56294, is immediately downgradient of these PACs. No contaminants were detected above RFCA Tier I ALs and only thallium (5.9 micrograms per liter [ug/L]) was found above the Tier II AL (2 ug/L). However, the thallium concentration exceeds background (5.19 ug/L) by a small percentage. Furthermore, thallium is not a soil contaminant at SW-133.1 (Table 2.13). It is also not a contaminant at SW-133.3 (DOE 2001).

SW-133.2 - Downgradient of this PAC, aluminum concentrations in groundwater were greater than the RFCA Tier II AL in Well 58793 (range 44,900 to 64,200 ug/L), thallium was reported once at a concentration greater than the RFCA Tier II AL in well 63793 (4.3 ug/L), and uranium-233, 234 and uranium-238 concentrations (all less than 5 pCi/L) were greater than RFCA Tier II ALs in wells 58793, 63693, and 63793 downgradient of this PAC. Although the aluminum concentration exceeded background (11,240 ug/L), thallium did not exceed background (5.19 ug/L). Also, aluminum and thallium are not soil contaminants at PAC 133.2 (Table 2.6). With respect to the uranium isotopes, although the concentrations exceed the Tier II ALs, they are well below background (93 pCi/L for uranium-233,234 and 66 pCi/L for uranium-238). Furthermore, although uranium-233/234 and uranium-238 have maximum soil concentrations that are well above background, the average concentrations are more than an order of magnitude less (i.e., the significant uranium contamination in the subsurface soil is isolated) and, therefore, the PAC does not appear to be a significant source for groundwater uranium contamination.

SW-133.4 and SW-1702 - The nearest downgradient well (63093) contained methylene chloride concentrations above the detection limit and uranium-233/234 and uranium-238 concentrations above Tier II ALs. This well was sampled numerous times, and methylene chloride was only detected once. Additionally, methylene chloride is unlikely to be present in incinerator ash. Like SW-133.2, the uranium isotopes are at concentrations well below background. Also, although the maximum concentrations for all three uranium isotopes are well above background in subsurface soil at PAC SW-133.4 (Table 2.7) and SW-1702 (Table 2.8), the average concentrations are approximately an order of magnitude less. Again, the significant uranium contamination in the subsurface soil at these PACs is isolated, and therefore, the PACs do not appear to be significant sources for groundwater uranium contamination.

More recent data were collected for wells 63093 and 5686 directly downgradient in the Woman Creek drainage as shown in Table 2.10. The new uranium data for well 63093 indicate similar uranium concentrations as previous data. The concentrations of these uranium isotopes farther downgradient in the drainage (well 5686) are lower and below Tier II ALs.

Table 2.10
Uranium Concentrations in Groundwater Downgradient of SW-133.4 and SW-1702
(August 2001)

Analyte	Result	Unit	Minimum Detection Limit	Tier II Action Level	Tier III Action Level
Well 5686					
Uranium-233,-234	0.65	pCi/L	0.046	106	1.06
Uranium- 235	U	pCi/L	0.060	135	24
Uranium-238	0.53	pCi/L	0.046	586	103
Well 63093					
Uranium-233,-234	2.58	pCi/L	0.068	106	1.06
Uranium- 235	0.093	pCi/L	0.048	135	24
Uranium-238	1.92	pCi/L	0.014	586	103

Downgradient Surface Water Quality

As shown in Table 2.11, aluminum, antimony, cadmium, copper, iron, lead, manganese, mercury, silver, americium-241, gross alpha, gross beta, and plutonium-239/240 concentrations in nearby surface water locations have occurred at concentrations exceeding the surface water ALs. However, the previous analysis regarding surface soil, subsurface soil, and groundwater contamination strongly suggests that the Ash Pits are not a source for metal and radionuclide contamination in surface water. Furthermore, water quality data at downgradient station SW027 (surface water point of evaluation [POE]) and at Pond C-2 indicate these contaminants have never been detected above RFCA surface water ALs.

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Table 2.11
Analytes Detected Above Action Levels in Surface Water Near the Ash Pits

Location	Collection Date	Description	Result	Unit	Standard
Metals					
SW041	8/6/90	Aluminum	90 6	ug/L	87
SW041	8/6/90	Aluminum	99 1	ug/L	87
SW039	4/12/90	Aluminum	238	ug/L	87
SW041	4/5/90	Aluminum	631	ug/L	87
SW040	7/30/87	Aluminum	2500	ug/L	87
SW041	9/5/90	Antimony	11 4	ug/L	6
SW039	11/8/90	Antimony	14 7	ug/L	6
SW039	9/13/90	Antimony	22 4	ug/L	6
SW041	7/8/91	Antimony	29	ug/L	6
SW039	9/13/90	Antimony	14 4	ug/L	6
SW039	11/8/90	Antimony	15 6	ug/L	6
SW041	6/4/91	Cadmium	1 9	ug/L	1 5
SW041	7/8/91	Cadmium	2	ug/L	1 5
SW039	6/4/91	Copper	16	ug/L	16
SW041	6/4/91	Copper	28	ug/L	16
SW041	8/5/91	Iron	1010	ug/L	1000
SW041	9/5/91	Iron	1100	ug/L	1000
SW041	4/5/90	Iron	1320	ug/L	1000
SW041	12/4/90	Iron	13900	ug/L	1000
SW041	12/4/90	Iron	13900	ug/L	1000
SW041	11/20/89	Iron	15900	ug/L	1000
SW041	2/6/90	Iron	1970	ug/L	1000
SW041	6/16/89	Iron	2090	ug/L	1000
SW041	5/3/91	Iron	2670	ug/L	1000
SW041	5/3/91	Iron	2670	ug/L	1000
SW041	2/6/90	Iron	3550	ug/L	1000
SW039	12/4/90	Iron	5390	ug/L	1000
SW039	12/4/90	Iron	5390	ug/L	1000
SW041	5/26/89	Iron	5480	ug/L	1000
SW041	6/4/90	Iron	6800	ug/L	1000
SW041	12/5/89	Iron	8180	ug/L	1000
SW039	11/18/91	Lead	8	ug/L	6 5
SW039	12/20/89	Lead	7 3	ug/L	6 5
SW041	12/5/89	Lead	6 6	ug/L	6 5
SW041	12/4/90	Manganese	1100	ug/L	1000
SW041	12/4/90	Manganese	1100	ug/L	1000
SW039	11/17/89	Mercury	0 33	ug/L	0 01
SW041	5/26/89	Mercury	0 44	ug/L	0 01
SW039	4/6/89	Mercury	0 3	ug/L	0 01
SW041	3/1/89	Mercury	1 1	ug/L	0 01
SW039	3/21/90	Mercury	0 25	ug/L	0 01

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Location	Collection Date	Description	Result	Units	Standard
SW039	4/12/90	Mercury	0.3	ug/L	0.01
SW039	11/17/89	Mercury	0.33	ug/L	0.01
SW039	4/15/92	Silver	2.7	ug/L	0.6
SW041	12/4/90	Silver	3.4	ug/L	0.6
SW041	12/4/90	Silver	3.4	ug/L	0.6
SW041	9/5/90	Silver	3.5	ug/L	0.6
SW041	11/5/90	Silver	9.8	ug/L	0.6
SW041	7/8/91	Silver	3	ug/L	0.6
SW041	11/5/90	Silver	9.8	ug/L	0.6
Radionuclides					
SW039	1/17/90	Americium-241	0.162	pCi/L	0.15
SW039	1/17/90	Americium-241	0.162	pCi/L	0.15
SW041	6/4/90	Gross Alpha	40.1	pCi/L	7
SW041	6/16/89	Gross Alpha	57	pCi/L	7
SW041	1/4/90	Gross Alpha	8.3	pCi/L	7
SW041	1/4/90	Gross Alpha	8.3	pCi/L	7
SW039	7/16/90	Gross Beta	23.69	pCi/L	8
SW041	1/4/90	Gross Beta	14.9	pCi/L	8
SW041	6/4/90	Gross Beta	36	pCi/L	8
SW041	6/16/89	Gross Beta	41	pCi/L	8
SW039	6/27/88	Plutonium-239/240	0.219	pCi/L	0.15

Screen 5 – Are COC concentrations above Table 3 Action Levels for ecological receptors?

At this time, ecological ALs are not available for all receptors/chemical combinations, however, draft ALs are available for a small subset of chemicals. Screen 5 currently evaluates only this subset. Risk to ecological receptors will be readdressed through the ecological risk assessment portion of the CRA.

As shown in Table 2.12, maximum concentrations for beryllium and lead exceed the ecological ALs in all of the ash pits, in most cases, the average concentrations also exceed the ALs as well as background. The highest concentrations of lead and beryllium are observed in PAC SW-1702, where the average concentrations exceed the ALs by more than an order of magnitude (Table 2.8).

Table 2.12
Ecological Action Level Exceedances

Site ID	SOI	Max Conc Exceeds Ecological AL?	Avg Conc Exceeds Ecological AL?	Avg Conc Exceeds Background?
SW-133 1	Beryllium	Yes	No	No
SW-133 1	Lead	Yes	Yes	Yes
SW-133 2	Beryllium	Yes	Yes	Yes
SW-133 2	Lead	Yes	Yes	Yes
SW-133 4	Beryllium	Yes	No	No
SW-133 4	Lead	Yes	Yes	Yes
SW-1702	Beryllium	Yes	Yes	Yes
SW-1702	Lead	Yes	Yes	Yes

Evaluate accelerated action in accordance with Sections 4.2.C and 5.3.I and consider any subsequent screens in the evaluation, as appropriate.

In accordance with Section 4 2 C of Attachment 5 (DOE et al 2003), DOE will consider the target species and exposure unit for that species, and the location, areal extent, and concentration of contamination in evaluating and determining appropriate accelerated actions necessary to protect ecological resources

SW-1702 material contains average lead and beryllium concentrations that significantly exceed the ecological ALs. As a first step in evaluating the risk posed to the ecological receptors, the ecological receptor that is the basis for the AL was identified

Beryllium

The beryllium AL of 2 15 mg/kg is based on protection of the prairie dog¹

Lead

The lead AL of 25 6 mg/kg is based on protection of the American Kestrel. Because the American kestrel, a bird of prey, would not be directly exposed to the buried material, preliminary remediation goals (PRGs) for other ecological receptors were examined². The PRGs for protection of the prairie dog and Preble's meadow jumping mouse (PMJM) are 149 mg/kg and 642 mg/kg, respectively.

¹ It should be noted that the background beryllium concentration for subsurface soil is 14 2 mg/kg which exceeds the AL. In this case and in all cases where background levels exceed the AL for protection of ecological receptors, achieving background levels becomes the cleanup goal.

² The AL is the lowest PRG above Site background levels that was calculated for each of the five selected wildlife receptors judged to be representative of species at RFETS: PMJM and black-tailed prairie dog (fossorial [burrowing] small mammals), mourning dove (small ground-feeding bird), terrestrial invertebrate (multiple species), and American kestrel (avian predator). See also Footnote 1.

As shown in Tables 2 12 through 2 16, SW-1702 has significantly higher concentrations of beryllium and lead than the other Ash Pits, and the average concentrations exceed the AL/PRG for burrowing animals (the PMJM-based PRG for beryllium is 8 71 mg/kg) Although the concentrations of these COCs exceed the PRGs for protection of the PMJM, the mouse typically burrows to a depth of only 15 inches, and the buried material is 3 feet bgs at the Ash Pits per the HRR (DOE 1992) Therefore, it is unlikely that the PMJM will be exposed to the material Furthermore, the areal extent of SW-1702 is relatively small compared to the habitat areas on Site, and, accordingly, the risk to the PMJM (and prairie dog) is also proportionately low Lastly, SW-1702 is in a PMJM habitat, and it is uncertain that removal of the buried material and disruption of the habitat would result in a net benefit to the PMJM

Stewardship Evaluation

Application of the Soil Risk Screen to the Ash Pits, specifically Ash Pit 1 (SW-133 1), Ash Pit 2 (SW-133 2), Ash Pit 4 (SW-133 4), and the Recently Identified Ash Pit (TDEM-2) (SW-1702), indicates NFAA is necessary for protection of public health and the environment However, because subsurface soil at some of these PACs has contaminant concentrations that exceed soil ALs, both near-term and long-term stewardship actions have been recommended³ They are discussed below

Near-Term Management Recommendations

Near-term recommendations for environmental stewardship include the following

- Continued groundwater monitoring will evaluate the potential impacts to surface water quality
- Excavation at the area will continue to be controlled through the Site Soil Disturbance Permit process
- Site access and security controls will remain in place pending implementation of long-term controls

Long-Term Stewardship Recommendations

Based on remaining environmental conditions at the Ash Pits, no specific long-term stewardship activities are recommended beyond the generally applicable Site requirements that may be imposed on this area in the future, which are dependent upon the final remedy selected Institutional controls that may be used as appropriate for this area include the following

³ The Ash Pits are contiguous with the Industrial Area (IA) where subsurface soil contaminant concentrations will likely exceed soil ALs at some locations Considering the large size of the IA relative to the Ash Pits, there would be no significant reduction in the area requiring near-term and long-term stewardship actions if the contaminated subsurface soil at the Ash Pits were removed

- Prohibitions on construction of buildings,
- Restrictions on excavation or other soil disturbance,
- Prohibitions on groundwater pumping in the area of the Ash Pits, and
- Monitoring for or prevention of intrusion by burrowing animals

It is also proposed that the groundwater monitoring network in the vicinity of the Ash Pits be evaluated between now and Site closure to determine its adequacy in detecting releases from the Ash Pits. A new well(s) will be added if appropriate. Furthermore, a marker will be placed near the southwestern corner of the westernmost ash pit to monitor bank erosion, if any, that may occur. These specific long-term stewardship recommendations will also be summarized in the Rocky Flats Long-Term Stewardship Strategy. No engineered controls, other environmental monitoring, or physical controls (e.g., fences) are recommended as a result of the conditions remaining at the Ash Pits.

The Ash Pits will be evaluated as part of the Sitewide CRA, which is part of the RCRA RFI/RI and CMS/FS that will be conducted for the Site. The need for and extent of any more general, long-term stewardship activities will also be analyzed in RFI/RI and CMS/FS and will be proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in the CAD/ROD, in any post-closure CHWA permit that may be required, and in any post-RFCA agreement.

Action/No Further Accelerated Action Recommendation

Ash Pit 1 (SW-133 1), Ash Pit 2 (SW-133 2), Ash Pit 4 (SW-133 4), and the Recently Identified Ash Pit (TDEM-2) (SW-1702) are proposed for NFAA. The Subsurface Soil Risk Screen and soil ALs in the RFCA Attachment 5 Modification (DOE et al. 2003) have been applied to these PACs. The risk screen shows an insignificant potential adverse risk to a WRW because the waste is buried. In addition, the Ash Pits area, although located in a landslide deposit, is in a stable configuration with a gentle slope and a well-established vegetative cover to minimize erosion.

It is possible a burrowing animal may bring contaminated soil to the surface, however, the incremental risk to the WRW is small because the Ash Pits area is relatively small compared to the exposure unit size for the worker. Although concentrations of lead and beryllium exceed the PMJM (and prairie dog) PRGs, particularly in PAC 1702, the mouse typically burrows to a depth of only 15 inches, and there is 3 feet of soil cover on the Ash Pits. Furthermore, the volume of waste and areal extent of PAC SW-1702 is relatively small, and accordingly, the risk to the PMJM is also proportionately low.

There is little potential for contaminated runoff to impact surface water quality because the waste is buried and covered, the Ash Pits are located far enough from Woman Creek that it is unlikely bank erosion would impact the Ash Pits, and they are located outside the 100-year floodplain. Examination of groundwater quality indicates a potential for

low-level uranium contamination that may have arisen from the Ash Pits, but no impacts from other contaminants. However, uranium is not a contaminant that exceeds surface water ALs in Woman Creek, and, therefore, there is no apparent impact to surface water quality from the Ash Pits. Application of the Soil Risk Screen indicates NFAA is required.

DOE received concurrence of NFAA status for PAC NE-111 4 on June 12, 2003 (S H Gunderson, T Rehder letter, to J Legare, 2003)

References

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PAC REFERENCE NUMBER: 000-101

IHSS Number 000-101, IHSS Group 000-1

Operable Unit Industrial Area (Former Operable Unit 4)

IHSS Group 000-1

Unit Name Solar Evaporation Ponds

Approximate Location N750,725, E2,084,760

Date(s) of Operation or Occurrence

1953 - 2002

The SEP operated in varying configurations since December 1953 when waste was first sent to the original clay-lined solar pond (Pond 2) The original clay-lined pond was supplemented and eventually replaced by other solar ponds In general, the first use of a solar pond would typically begin shortly after its construction

Description of Operation or Occurrence

The SEP were used primarily for the storage and evaporation of low-level radioactive wastes contaminated with high concentrations of nitrate Building 774, the Process Waste Treatment Plant, was designed primarily for the removal of radioactive contaminants and not the removal of nitrate The SEP were also used for the storage and evaporation of other difficult-to-treat wastes The design of the original solar pond is documented in Dow Drawing 1-1454-207 It was estimated in late summer 1955 that Pond 2 (the first pond) would be incapable of holding the waste volumes expected to be generated through the winter months, therefore, this pond was supplemented with an auxiliary pond in September 1955 The auxiliary pond was built adjacent to the southeastern corner of Pond 2 These two ponds shared a common corner with an overflow channel connecting the two ponds Water exceeding a certain level in Pond 2 would flow into Pond 2 Auxiliary

Construction of the first lined pond (known at that time as Pond 2A, later designated Pond 207A) was prompted by the knowledge that nitrate contamination from the earthen ponds was migrating off site On April 5, 1955, effluent leaving the RFETS boundary, which at that time did not include the BZ, contained 90 mg/L nitrate) Furthermore, Great Western Reservoir was being prepared for use as a municipal drinking water supply The first leakage of water from any of the solar ponds had been noted in June 1954 with the identification of a nitrate-contaminated spring on the hillside north of the

SEP The first lined pond was built of asphalt planking (asphalt-impregnated wood approximately ½ inch-thick) This pond was constructed immediately east of the two earthen ponds Dow Chemical Drawing 1-3398-207 documents the relationship of the new lined pond with the pre-existing earthen ponds All references in this document will henceforth use 207A to reference the first lined pond

Following construction of Pond 207A, the original pond and the auxiliary pond were allowed to dry The original clay-lined pond had some additional clay added to the eastern edge to prevent leakage, and the auxiliary pond was fully lined with clay The ponds were returned to service shortly after lining activities took place and were used routinely until June 1960 After June 1960, routine use of the clay-lined ponds is not documented, although an additional release to Pond 2 was made in March 1963 Photographs of Ponds 2, 2 Auxiliary, and 207A have been discovered which clearly show the three ponds and their physical relationship to each other

The next major change in operations at the SEP was construction of a third earthen pond in support of testing oxidation of wastes in April 1959 The existing references indicate that the three earthen cells were used in series and the effluent from these three ponds was discharged to the sanitary wastewater treatment plant The tests were carried out over a few months during the late summer and early fall of 1959, and were ultimately unsuccessful The third earthen cell was constructed immediately east of the existing Pond 2, immediately west of 207A, and immediately north of Pond 2 Auxiliary The designation of this new pond was either Pond 2C or 2D, with the existing Pond 2 Auxiliary receiving the remaining designation It appears that the Pond 2 Auxiliary designation was no longer used

Construction of the 207B ponds began on November 11, 1959 The ponds were located immediately east of Pond 207A and consisted of three separate cells (North, Center, and South) During December 1959 construction activities, seepage was identified in the west edge of the excavation near the eastern side of Pond 207A A "covered drainage ditch" (later references to this device use the term "drainage tile" which will also be used here), was installed to collect the seepage water and release it to the hill just north of the ponds Dow Chemical Drawing 1-6217-207 documents the design and configuration of the asphalt plank-lined 207B solar ponds Construction of the 207B ponds was fully completed on June 16, 1960

The first placement of waste in the 207B ponds occurred on May 31, 1960 Upon use of the fully completed 207B ponds, leaks were almost immediately identified and the ponds were removed from service The leakage from the ponds was attributed to the reaction of acid wastes seeping beneath the asphalt planking and reacting with marl soil to produce carbon dioxide gas This gas then caused the asphalt floor of the ponds to lift, rupturing the seams A new lining and design for the 207B ponds was completed and submitted for bids The bids received in November 1960 were too high, and so the new pond configuration was redesigned and re-bids were requested for only the southern portion of the 207B ponds

Repair and relining of the 207B-South solar pond were completed on November 29, 1960. The 207B-South cell was returned to service in December 1960. Work on repair of 207B-North and -Center was started in April 1961. This work included the construction of a drainage tile immediately east of the 207B ponds that drained to the north. Difficulty was encountered in laying the asphalt on the bottom of the 207B-North pond. It was necessary to remove the asphalt planking in order to lay the asphalt concrete on the bottom. Repairs to 207B-Center and -North ponds were completed on August 17, 1961. Pond 207B-Center was returned to service on August 25, 1961, and 207B-North was returned to service on August 28, 1961.

Work related to the relining and redesign of Pond 207A began in April 1963 with the removal of liquids and salts so that the liner could be accessed. As Pond 207A was emptied, salts and sands remaining in the pond were drummed for removal from the ponds. Tests were conducted to determine whether the asphalt planking would be suitable for burning. It was found that the asphalt planking would not support combustion on its own. Removal of the asphalt planking and Pond 207A subgrade preparation was completed in September 1963. Disposal of the asphalt planking took place in the East Trenches (PAC NE-111.1 - NE-111.8). Relining and redesign of Pond 207A continued through November 18, 1963. Wastes were again placed in Pond 207A on May 28, 1964.

Pond 207C was constructed in 1970 primarily to allow the transfer of water from other solar ponds so that they could be repaired. The design of Pond 207C included a leak detection pipe placed immediately beneath the pond running from south to north where it could drain into a leak detection sump. Pond 207C remained in constant service until it was removed in late 2002.

In the mid-1980s activities for solar pond sludge cleanout began. The first step in these activities was to construct a building (Building 788) in which the pond sludge and Portland cement could be mixed to create "pondcrete." Building 788 was constructed between Ponds 207A and 207C. Pond sludge cleanout began in mid-1986. This activity, along with the transfers of solar pond water to the Building 374 evaporator, helped remove both the sludges and the liquids from the solar ponds. At times, however, problems with the cleanout effort occurred. Examples of these problems include pondcrete that had not hardened properly and flooding of some of the valve vaults used to help transfer solar pond water to Building 374 for evaporation.

An event occurred at the solar ponds on August 7, 1989, requiring the filing of a RCRA CPIR Report Number 89-012. This event involved an overflow of contaminated water from the Interceptor Trench Pump House (ITPH) wet well (PAC NE-1409). This overflow occurred because the circuit breakers supplying electricity to the pump motors were both tripped. Additional details concerning this incident can be found in the Response section of this PAC narrative as well as the narrative for PAC NE-1409 (DOE 1993).

A second event at the solar ponds took place from March 14, 1990 to March 16, 1990, which also required the filing of a RCRA CPIR (Report Number 90-003). This event

consisted of transfer of contaminated groundwater and precipitation from Pond 207B-North into Pond 207A. This transfer was made due to the lack of freeboard in Pond 207B-North which presented a potential for overflow of the pond. The transfer was made with permission from CDH.

Physical/Chemical Description of Constituents Released

(See Original HRR [DOE 1992] for complete write-up)

The RFP SEP are often referred to in historical documents as the "high nitrate ponds". The most common characteristic of the wastes released to the SEP was high concentrations of nitrate. The solar ponds typically had untreated process waste placed in them, but occasionally treated process waste was also placed in the ponds. The RFP process waste treatment plant was designed to remove radioactive contamination of process wastes (and also achieved some removal of metals), but it was not designed to remove nitrate. The monthly history reports from the RFP waste group detailed the originating pond construction, quantity of water transferred, and activity present in the water released to the solar ponds. These history reports also stated which solar ponds received these waters. Only limited information was found on more detailed chemical analyses of the wastes released to the solar ponds. One of these references does provide a relatively complete characterization of Pond 207A water from the fall of 1958. The analyses available in this report cover activity of plutonium, uranium, total solids, total nitrate, pH, specific gravity, aluminum, chromium (VI), fluoride, iron, magnesium, silicon dioxide, sulfate, total halides, and an extensive list of metals. There are also analytical results presented for a compound R_2O_3 , which is described as "the combined oxides including those cations precipitated with ammonium hydroxide even in the presence of a large concentration of ammonium chloride". Of particular note in this reference is the fact that the pH range reported was 0.87 to 0.97, with an average of 0.93. The pH reported for June 1958 was 1.21.

The monthly history reports from the RFP waste group mention when other materials were placed in the solar ponds or handled near the ponds. For a period of time, waste radiography solutions were drummed for storage and evaporation in the solar ponds and lithium scrap was sprayed with water for destruction of the lithium metal between the solar ponds. During late 1973 and early 1974, leachate collected from the RFP sanitary landfill was pumped to the solar ponds for storage and evaporation. It is also known that sewer sludge, cyanide wastes, and acid wastes were placed in the solar ponds for at least a portion of the time the solar ponds have been in use. The handling of these materials was nonroutine, and is not thought to have composed a major portion of the waste materials placed in the ponds.

Responses to Operation or Occurrence

(See Original HRR [DOE 1992] for complete write-up)

Relining and patching of the solar ponds were response activities to the possibility of leakage. Relining and patching activities were conducted a number of times throughout the history of the ponds.

After installation of the drainage tile (between Pond 207A and Pond 207B) in December 1960, analysis of the water flowing from that tile became a routine daily activity. The water was sampled on a daily basis for flow, temperature, total alpha activity, nitrate, and pH. Typically, only gross alpha activity and flow rate were reported. Flow rates in the drainage tile were variable with flows of hundreds of gallons per hour not uncommon. The chemical characteristics of the water flowing out of the pipe also varied considerably, but at times the water had elevated levels of gross alpha activity (up to thousands of picocuries per liter [pCi/L]). The analyses for samples of water from the drainage tile can indicate some of the chemical characteristics of the constituents released, however, the analytical parameters that were evaluated on water samples collected from the drainage tile are limited in scope. Similarly, the drainage tile immediately east of the 207B ponds installed in 1961 was also sampled for environmental analyses. The analytical data from this sampling were presented in the Solar Pond Closure Plan of 1988 under the title of Sump 1.

During November 1960, six groundwater monitoring wells were installed near the 207B solar ponds. The first chemical analysis of water collected from the groundwater sampling wells in January 1961 indicated that nitrate contamination was present in the groundwater in concentrations up to 800 mg/L. Sampling of the six wells became a routine activity with data reported in the RFP waste group's history reports. In addition to the activities discussed above, two sumps, six trenches, and french drains were constructed in the area north of the solar ponds to allow the collection and return of contaminated groundwater to the solar ponds. These actions were largely prompted by the RFP policy to keep waters in the A-series drainage below the State Public Health Service limit for nitrates in drinking water (10 mg/L).

Removal of Pond 2 Auxiliary - Pond 2 Auxiliary was removed in preparation for the construction of Building 779. Surveys of the Pond 2 Auxiliary area soil indicated readings between 2,500 to 5,000 cpm. Clay samples of the pond had 75,000 dpm/kg, which was described as 2-1/2 times soil background in the area. The proposed activity was to remove the clay lining to a depth of 6 inches. This material was to be disposed by burial in the dried sewage sludge trenches (PAC 900-109, PAC NE-110, PAC NE-111 1, and NE-111 8). The pond berms were to be leveled after removal of the clay liner. No documentation confirming the fate of the soil has been found.

Removal of Pond 2 and Pond 2C or 2D - Pond 2 and the earthen pond immediately east of it (Pond 2C or 2D) was removed in preparation for construction of Pond 207C in 1970. The soil potentially impacted from operation of the two referenced earthen ponds was reworked and possibly incorporated into the berm for Pond 207C. No documentation has been found indicating that radiation surveys or soil removal and disposal operations were conducted.

ITPH System - The ITPH system (Building 308D) was installed in 1980 and 1981 and removed in 2002 as part of the D&D program. The pump station is identified by a number of names including Main Sump, Main Nitrate Sump, Nitrate Sump, Solar Pond Sump, French Drain Sump, and B308D, among others. In this report, the pump station and the french drain system are referred to as the ITPH. The ITPH system was designed primarily to collect subsurface water. Engineering drawings (as built) for the design of the ITPH system are as follows: Rockwell International Drawings 27550-033, 27550-040, 27550-050, 27550-200, 27550-201, and 27550-202. Although the ITPH system was much more extensive than the trench and sump system that it replaced, the ITPH system was extended shortly after construction of the original parts of the ITPH system. It was this extension of the system that was referred to as the "Interceptor Trench."

The ITPH system was extended due to concerns over the existence of groundwater seeps immediately north of the solar ponds. The extension of the ITPH system consisted of a new french drain that paralleled the old Patrol Road. This extension of the ITPH system was designed and built with gravel backfill from the drain to the surface so that it would collect both groundwater and surface water flow. This extension also provided for the collection of footing drain flows from Building 771 and 774, through a 4-inch-diameter polyvinyl chloride (PVC) pipe.

Engineering drawings for the design of the ITPH system extension are Rockwell International drawings 26637-01 and 26637-02. These as-built drawings indicate that the ITPH system extension was built between February and June 1982. This system collected groundwater and surface water runoff (from the area immediately north of the solar ponds and south of the new perimeter security zone (PSZ) perimeter patrol road), which drained by gravity to a pump station located near North Walnut Creek. The pump station consisted of a wet well and a duplex installation of self-priming pumps. The ITPH pumps the collected incoming water to Pond 207B-North. Water from this pond was transferred to other solar ponds or force-evaporated in Building 374. Some of the water from 207B-North was spray irrigated in the West Spray Field (see PAC 000-168).

Solar Pond Cleanout - Solar pond cleanout was a response action to the presence of waste materials in the solar ponds and the presence of contamination in nearby soils, groundwater, and surface water. Some solar pond cleanout activities were conducted to allow relining activities to take place, such as the relining of 207A in the early 1960s. However, in most cleanouts conducted earlier than those described below, the waste materials were immediately reintroduced upon completion of the relining activities or repairs.

From fall 1976 to fall 1977, the 207B solar ponds were cleaned and decommissioned with respect to use for storage of process wastewater. This cleanout was done in support of the water recycle program being implemented at RFP. All three cells of the 207B pond were cleaned, but only 207B-South was relined. This relining was done with a hypalon liner. During these cleanout and relining activities, soil to the south, east, and between the solar ponds was also removed to better clean the area. Process waste was not reintroduced to the ponds. Since the cleanout activities, these ponds have been used for reverse osmosis.

plant brine, treated sanitary sewage effluent, and contaminated groundwater collected by the ITPH system

The cleanout of process waste sludge in the 207A pond began in 1986 with the completion of Building 788 – a pondcrete production building. The removal of the process waste and sludge from 207A was completed in 1988. In 1988 the final volume of sludge was removed from 207A and the final volume of water was transferred to the 207B ponds. The sludge was handled by combining the sludge with Portland cement, creating pondcrete. The pondcrete was largely stored on site however, some pondcrete was shipped off site for disposal. In the late 1990s all of the remaining pondcrete was shipped off site to the Envirocare facility.

In March 1990, contaminated groundwater transferred to the 207B solar ponds from the ITPH was placed in Pond 207A to prevent overflowing of the 207B solar ponds. All of the water present in 207A was removed during 1991 and evaporated at the Building 374 forced evaporator.

Valve Vault Flooding - The valve vault flooding of October 21, 1989, was related to the transfer of solar pond water to Building 374 for evaporation. The incident resulted in the filing of a RCRA CPIR (Report Number 89-015). Solar pond water in this incident was entirely contained within the valve vaults with no environmental release. In addition to the report, piping repairs were made as well as piping upgrades.

Piping of Contaminated Snowmelt - On March 10, 1990, it was discovered that approximately 1,440 gallons of domestic water and contaminated snowmelt was being pumped out of a containment berm to the nearby ground. In response to this incident, a RCRA CPIR (Report Number 90-002) was filed and controls over this type of activity were upgraded.

Transfer of Water to 207A - For the March 1990 event involving transfer of water from the 207B solar ponds to the 207A solar pond, a RCRA CPIR was filed (Report Number 90-003). Additionally, piping changes were made that allowed the transfer of water from the solar ponds to Building 374.

Recent Characterization Sampling and Remediation The SEP AOC (IHSS 000-101) was sampled in 2002 in accordance with the Industrial Area Sampling and Analysis Plan (IASAP) Addendum #IA-02-07 (DOE 2002a). Further, sampling within IHSS 000-101 was performed under IASAP Addendum #IA-03-02 (DOE 2002b) during characterization efforts for IHSSs 900-165 and 900-176, which overlap the SEP AOC. Analytical data and sampling locations are presented in the Data Summary Report for IHSS Group 000-1 (DOE 2003a), as well as the Closeout Report for IHSS Group 000-1 (K-H 2003b). Following receipt of the analytical data (mentioned above), the berms for the five ponds were pushed in and the area was leveled in late 2002.

Soil, pipelines, vaults, and other pipes and structures were removed in accordance with the Environmental Restoration (ER) RSOP 02-08 (DOE 2002c). A Proposed Action Memorandum (PAM) (DOE 2003c) was developed for the SEP AOC, which described

the closure of the AOC Closure of RCRA Units 21 and 48 was also described The PAM, which included a risk assessment for the AOC, was approved by the regulatory agencies on May 22, 2003 (S H Gunderson letter to R DiSalvo 2003)

Fate of Constituents Released to Environment

At one time it was believed that most of the contaminants released from the solar ponds contaminated soil and groundwater in the immediate vicinity of the ponds It is known that in the past some of the contaminated groundwater and seepage reached North Walnut Creek and migrated off site However, this migration of contamination is believed to have largely been corrected first by the installation of the trenches and sumps and later by the installation of the ITPH system Some older studies tried to estimate the inventory of nitrate contamination in the soil north and east of the solar ponds Extensive groundwater and soil sampling activities have been conducted since 1986 in order to better address the fate of contaminants released to the environment from the solar ponds These sampling activities are discussed in the Solar Evaporation Pond Closure Plans of July 1, 1988 (DOE 1998) and in the Solar Pond RCRA Facility Investigation/Remedial Investigation Work Plan (DOE 1994) Historically, radiological activities in surface soils near the edges of the SEP were observed to be low level (102 dpm per 100 square centimeters [cm²])

Based upon the characterization sampling results presented in the Closeout Report for IHSS Group 000-1, Solar Evaporation Ponds Area of Concern (DOE 2003b) and the IHSS Group 000-1 Data Summary Report (DOE 2003a), protective media cleanup standards for human health were achieved at 1E-05 to a WRW There were no analytical results above the RFCA WRW ALs and all contaminant concentrations were less than Ecological Receptor ALs, except for lead, which exceeded ALs at six locations (DOE et al 2003) Of the six locations, 5 were consistent with background concentrations (either slightly above or below 54 62mg/kg) The sixth location was 236 mg/kg and was removed

Action/No Further Accelerated Action Recommendation

Based upon the results of the soil samples collected, no current or potential contaminant source was identified PCOCs for IHSS 000-101 were not detected at concentrations greater than RFCA WRW ALs (DOE et al 2003) As stated above, lead concentrations exceeded ecological receptor ALs at six locations Of the six locations, five were consistent with background concentrations The sixth location was removed in accordance with ER RSOP Notification 02-08 (DOE 2002c) in November of 2002

No long-term stewardship activities are recommended for IHSS Group 000-1 AOC beyond the generally applicable Site requirements that may be imposed on this area in the future Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 000-1 AOC No specific engineered controls are anticipated as a result of the conditions remaining in IHSS Group 000-1 Current groundwater monitoring will continue

DOE received concurrence of NFAA status for Group 000-1 AOC on July 25, 2003 (S H Gunderson letter to J. Legare, 2003a) Concurrence for NFAA for Groups 900-165 and 900-176 was received on July 29, 2003 (S H Gunderson letter to J Legare)

Comments

Regulatory agency concurrence on the NFAA for the IHSS Group 000-1 AOC, IHSS 000-165, and IHSS 000-176 and approval of the PAM constitute an NFAA for the entire IHSS Group 000-1 As part of this NFAA, two boundary changes were completed that moved portions of IHSS Group 000-1 to other IHSS Groups (Appendix 4)

References

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K-H, 2003a, Data Summary Report for IHSS Group 000-1, Rocky Flats Environmental Technology Site, Golden, Colorado, June

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PAC REFERENCE NUMBER: 100-148

IHSS Number 148

Operable Unit Industrial Area (Former Operable Unit 13)

IHSS Group 100-4

Unit Name Waste Leaks (IAG Name Waste Spills)

Location N749,000, E2,082,000 (Building 123)

Date(s) of Operation or Occurrence

No documentation was found that detailed the dates of occurrence Building 123 was first occupied in 1953 It is believed that leaks of process waste could have occurred from the start of operations up to approximately 1975

Description of Operation or Occurrence

Persons interviewed for the CEARP Phase 1 document indicated that several small spills of nitrate-bearing wastes occurred around the outside of Building 123 These wastes may have contained radionuclides Additionally, interviewees indicated that there were potential releases of nitrate-bearing wastes from the OPWL buried beneath Building 123 This pipeline was in use from the start of operations in Building 123 until the OPWL were replaced by the New Process Waste Lines (NPWL) The abandonment of the OPWL beneath Building 123 occurred no later than February 1975 when engineering drawings documented the abandonment of the OPWL system The OPWL were typically abandoned in-place

Building 123 was serviced by a 4-inch-diameter process waste line buried beneath the north and east wings of the building The main process waste line drained from west to east in the north wing, and from north to south in the east wing The pipe was sloped at 1 percent A number of connections were made to the main pipe, some of which consisted of headers servicing a number of process waste drains in the building The pipe was probably constructed of a type of iron called "Duriron" The OPWL piping from Building 123 led to an underground tank system behind Building 441 that collected wastes generated by both Buildings 123 and 441 From this tank system, the process waste materials were pumped out for treatment in the process waste system

The OPWL drain was not double-contained, and varied in depth from approximately 0.5 to 3 feet beneath the bottom of the concrete floor of Building 123 The line came out from beneath the southern end of the east wing of the building, with an invert elevation of

approximately 6,032 5 feet Interviewees have stated that this line, being constructed of a type of iron, probably leaked considerable amounts of waste without personnel being aware of the leak The types of waste consisted of laboratory wastes from analysis of urine, fecal, and other bioassay samples Nitrates and low levels of radionuclides were associated with the wastes carried in the OPWL The NPWL that replaced the OPWL consisted of either double contained or overhead lines (DOE 2000a) Leakage from the NPWL would be easily detected

Physical/Chemical Description of Constituents Released

Building 123, the Health Physics Laboratory, generated low-level radioactive waste as well as chemical wastes Process wastes reportedly leaked from the OPWL, including nitrate-bearing wastes that may have contained radionuclides Unconfirmed reports of contaminant spills were also indicated in interviews with building employees In the late 1960s or early 1970s, a cesium-contaminated liquid was reportedly spilled on the concrete floor in Room 109 The floor was immediately sealed to immobilize the contamination Room 109 also contained source storage pits Undocumented thorium research was performed in Room 105 Scoping surveys conducted in May through July 1997 revealed elevated levels of radioactivity in both Rooms 105 and 109 In-situ gamma spectroscopic measurements performed in August 1997 indicated the presence of cesium-137 and thallium-232 in Rooms 109 and 105, respectively (RMRS 1998)

As described in IASAP Addendum #IA-02-01 (DOE 2001a), PCOCs at IHSS 148 were determined based on data collected during the characterization of UBC Site 123, as summarized in the Final Data Summary Report for the Characterization of UBCs 123 and 886 (DOE 2001b), and data collected during previous studies (DOE 2001c, DOE 2000b) These pre-accelerated action data, greater than background plus two standard deviations or method detection limits (MDLs), along with RFCA Tier I and Tier II ALs are referenced in the Closeout Report Because a sufficient number of samples were collected during previous studies to characterize IHSS 148, additional characterization was not required Results from previous sampling and analysis of surface and subsurface soil at UBC Site 123 and IHSS 148 indicated that

- Lead was detected in subsurface soil above the Tier I AL at one location,
- Radionuclides and metals were detected at concentrations above background plus two standard deviations at UBC Site 123 and IHSS 148,
- An arsenic concentration exceeding the Tier II AL but below background was detected at one location in surface soil,
- A beryllium concentration exceeding the Tier II AL was detected at one location in surface soil, and
- Methylene chloride was detected in subsurface soil at levels slightly above the RFCA Tier II AL

Responses to Operation or Occurrence

The accelerated action included removal of the Building 123 slab, footers, source pits, manholes, sumps, process waste lines, and contaminated soil, as well as site reclamation (DOE 2002) Activities were conducted between January 29 and April 18, 2002 Details are provided in the Closeout Report for IHSS Groups 100-4 and 100-5 (DOE 2003)

Additional removal actions beyond ER RSOP Notification #IA-02-01 accelerated action goals (DOE 2002) were not required at IHSS 100-4 because of the following

- Residual radionuclide activities in subsurface soil were less than RFCA Tier II and WRW ALs and only slightly greater than background plus two standard deviations
- Residual lead concentrations in subsurface soil were less than the Tier II and WRW ALs but were greater than the Ecological Receptor AL
- Residual SVOC concentrations were less than Tier II and WRW ALs
- Radionuclide activities in surface soil were less than Tier II and WRW ALs and only slightly greater than background plus two standard deviations (DOE 2003)
- A beryllium concentration in surface soil, outside of UBC 123, IHSS 148, and PAC 100-611 but within the AOC, at only one location and was 0.16 milligrams per kilogram (mg/kg) greater than the RFCA Tier II AL but less than WRW and Ecological Receptor ALs
- Methylene chloride concentrations in subsurface soil, outside of UBC Site 123, IHSS 148, and PAC 100-611 but within the were greater than the RFCA Tier II AL at six locations Methylene chloride does not pose a significant risk at these concentrations Additionally, methylene chloride was found in laboratory blanks associated with the data set
- All excavated areas were backfilled and revegetated after confirmation sampling results were received and discussed with regulatory agencies through the consultative process Excavated soil with radionuclide activities less than RFCA Tier II ALs was used as backfill in the trench from which it was removed Additionally, 32 end-dump loads of topsoil from offsite sources were used to bring excavated areas up to grade
- The IHSS Group 100-4 area was rough-graded before topsoil was distributed over the site The topsoil was graded, then scarified, and a seed mix consisting of Canada bluegrass was spread over the site using broadcast seeding methods Hydromulch was applied to conserve moisture and prevent seed erosion

Fate of Constituents Released to Environment

Sumps and process waste lines within IHSS 100-148 were excavated and packaged for disposal. Confirmation sampling results from the soil beneath the sumps and process waste lines indicated that all contaminant concentrations were less than RFCA Tier II ALs. Therefore, there is no actual or potential risk to human health or the environment.

Action/No Further Accelerated Action Recommendation

Based upon characterization sample results collected in accordance with IASAP Addendum #IA-02-01 (DOE 2001a), no potential contaminant or residual contaminant source could be identified.

DOE received concurrence of NFAA status for IHSS Group 100-4 on April 22, 2003 (S H Gunderson letter to R DiSalvo).

Comments

None

References

DOE, 2000a, Final Sampling and Analysis Plan for the Characterization of Under Building Contamination for UBC 123 and Building 886 Implementing Horizontal Directional Drilling and Environmental Measurement While Drilling, Rocky Flats Environmental Technology Site, Golden, Colorado, May

DOE, 2000b, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, CO, September

DOE 2001a, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, CO, November

DOE 2001b, Final Data Summary Report for the Characterization of UBCs 123 and 886, Rocky Flats Environmental Technology Site, Golden, CO, September

DOE, 2001c, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, CO, June

DOE 2002, Environmental Restoration RFCA Standard Operating Protocol Notification #02-01, Rocky Flats Environmental Technology Site, Golden, CO, January

DOE 2003 Closeout Report for IHSS Groups 100-4 and 100-5, Rocky Flats Environmental Technology Site, Golden, CO, March

Gunderson, S H, letter to R DiSalvo, 2003, Final Closeout Report for IHSS Groups 100-4 and 100-5, April 22

RMRS, 1998, Proposed Action Memorandum for the Decommissioning of Building 123,
RF/RMRS-97-012, Rocky Flats Environmental Technology Site, Golden, CO, March

PAC REFERENCE NUMBER: 100-609

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	100-5
Unit Name	Building 121 Security Incinerator
Location	N749,500, E2,081,500 (south of Building 121)

Date(s) of Operation or Occurrence

No documentation was found that details the dates of operation. It is known that the incinerator was operating in December 1980 and was still in existence in 1985 (DOE 1992).

Description of Operation or Occurrence

The security incinerator was located south of Building 121 and was used for incineration of classified documents. During some period in its operating history, the incinerator was used to burn no carbon required (NCR)-type paper containing PCBs. It is known that ash from the incinerator was being disposed of at the Present Landfill (PAC NW-114) in December 1980. It is not known whether this was standard practice throughout the incinerator's operating history.

Physical/Chemical Description of Constituents Released

According to one source, "tons" of NCR paper, containing up to 10 percent to 20 percent PCBs, was burned in the incinerator. Dioxins and furans could potentially have been generated from incineration of this paper.

Responses to Operation or Occurrence

As described in IASAP Addendum #IA-02-01 (DOE 2001), PCOCs at PAC 100-609 were determined based on historical knowledge (DOE 1992). PCOCs at this site are dioxins, furans, and PCBs. Surface soil samples were collected from six sampling locations beneath the incinerator concrete slab and analyzed.

Because there are no existing RFCA ALs for dioxin/furans, a different framework was used for comparison of analytical results. Both EPA cleanup guidelines (EPA 1998) for residential and industrial use (in accordance with RFCA) and a value of 9 parts per

trillion (ppt) toxicity equivalents (TEQs) (consultative process) were used for comparison. Results for dioxin/furan were converted to TEQ using a toxicity equivalency factor (TEF) in accordance with SW8290 (EPA 1994) and a recent World Health Organization (WHO) (WHO 1995) and compared directly with the TEQ of 9 ppt. The TEQ values for dioxin congeners are summed for each sampling location and the TEQ values for furan congeners were summed for each sampling location. There are no exceedances of the 9 ppt TEQ for the summed dioxin or furan compounds. Results at one location indicated a value of 10.87 ppt for the summed dioxin and furans. While this value is slightly higher than the reference value of 9 ppt, it, as well as all other summated TEQ values are well within the cited Front Range background range of 0.1 to 155 ppt TEQ. Additionally, PCB concentrations did not exceed RFCA Tier II, Tier I, or WRW ALs (DOE 2003).

In accordance with the IASAP Addendum #IA-02-01 (DOE 2001), the AOC based on characterization data becomes the revised PAC shape. This change will be archived through the Site Geographic Information Services Group and is reflected on Plate 2 (Appendix 4).

There are no qualifications of the data. Results indicate that no chemical contamination exists in excess of RFCA Tier I, Tier II, or WRW ALs for PCBs, or for dioxins/furans in excess of TEQ.

Accelerated Action Description

The accelerated action objectives were developed and described in ER RSOP Notification #02-01 (DOE 2002). The accelerated action objectives for PAC 100-609 included the following:

- Remove the concrete slabs, which will be dispositioned in accordance with the RSOP for Recycling Concrete (DOE 1999), and
- Remediate soil if dioxins or furans are detected at levels greater than MDLs or levels agreed upon through the RFCA consultative process.

Concrete Slabs

The two slabs associated with PAC 100-609 were removed using a forklift after a corner of the slabs was broken up sufficiently with a jackhammer to gain access to the underlying soil. The main slab was 20 inches thick. One composite sample was collected from the concrete for waste characterization. The sample was analyzed for metals, dioxins, and furans. Concrete was surveyed for radiological constituents and recycled in accordance with the RSOP for Recycling Concrete (DOE 1999).

Soil Removal

Because all analytical results indicated that dioxin and furan concentrations were less than EPA cleanup guidelines for residential use and PCBs were less than RFCA Tier II ALs, no soil was removed. Therefore, confirmation samples were not collected because soil was not remediated. Characterization samples were analyzed at an offsite laboratory, which also serve as confirmation samples.

Site Reclamation

PAC 100-609 was covered with approximately 6 to 8 inches of roadbase, and wheel-rolled and compacted with a loader.

Fate of Constituents Released to Environment

No documentation was found detailing a release of contaminants from the operation of this incinerator.

Based on the actions taken and characterization results, there is no actual or potential risk to human health or the environment. Soil contaminant concentrations are below RFCA Tier II and WRW ALs and EPA cleanup guidelines.

Action/No Further Accelerated Action Recommendation

Based upon the removal of the two concrete slabs and subsequent sampling in accordance with the IASAP Addendum #IA-02-01 (DOE 2001), no potential contaminant or residual contaminant source could be identified.

DOE received concurrence of NFAA status for IHSS Group 100-5 on April 22, 2003 (S H Gunderson letter to R DiSalvo).

Comments

None

References

EPA, 1994, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Integrated Manual (SW-846), 3rd Edition, Office of Solid Waste and Emergency Response, September

EPA, 1998, EPA Cleanup Guidelines for Residential and Industrial Use

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, CO, September

DOE, 1999, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, CO

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, CO, November

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol Notification #02-01, Rocky Flats Environmental Technology Site, Golden, CO, January

DOE 2003, Closeout Report for IHSS Groups 100-4 and 100-5, Rocky Flats Environmental Technology Site, Golden, CO, March

Gunderson, S H , letter to R DiSalvo, 2003, Final Closeout Report for IHSS Groups 100-4 and 100-5, April 22

World Health Organization, 1998, Assessment of the Health Risk of Dioxins Re-Evaluation of the Tolerable Daily Intake (TDI), WHO European Center for Environment and Health, Geneva, Switzerland, May

PAC REFERENCE NUMBER: 100-611

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	100-4
Unit Name	Building 123 Scrubber Solution Spill
Location	N749,000, E2,082,000 (west side of Building 123)

Date(s) of Operation or Occurrence

November 7, 1989

Description of Operation or Occurrence

An inoperative pump in the Building 123 process waste transfer system caused the Building 123 scrubber system to overflow, spilling scrubbing solution into a bermed area outside of the building and into three pits beneath the floor of the building. Also, approximately 5 gallons of liquid were present in and around a nearby storm water drainage ditch that served the Building 123 parking lot. It was speculated that this liquid leaked from the berm wall interface with the underlying asphalt. However, it was later concluded that this liquid was not associated with the incident (i.e., it was in the ditch prior to the incident). All of the spilled solution was contained within secondary containment structures, and none of the solution was believed to have impacted the environment.

Under normal operating conditions, the scrubbing solution drained into the process waste system when the scrubbing process was completed. The spill occurred because waste pump switches were in the wrong position and the influent valve that was blocked by glass filtering wool from Building 123.

Normal scrubbing solution drainage was restored when the glass wool material was cleared and the inoperative process waste pump was restarted. A submersible pump was used to transfer the scrubbing solution from the bermed area to process waste drains in Building 123. Measures were proposed to prevent the subsequent buildup of glass wool in the process waste system. A RCRA CIPR (89-019) was written.

All spilled materials were contained and transferred into the Building 123 process waste system for eventual treatment at Building 374.

Physical/Chemical Description of Constituents Released

The scrubbing solution consisted primarily of water, which was used to scrub nitric acid, hydrofluoric acid, and hydrochloric acid used in Building 123. Approximately 50 gallons were released to the bermed area, and several hundred gallons were contained in the three pits beneath the Building 123 floor. Analyses indicated the solution in the bermed area had a pH of 1.6, and the solution in the three pits had a pH of 6.0.

The 5 gallons of liquid in the parking lot drainage ditch did not react when sodium bicarbonate was applied, indicating it was not acidic and, therefore, was not the scrubbing solution. Five samples were collected on February 5, 2002, and analyzed for pH (DOE 2001).

Responses to Operation or Occurrence

A submersible pump was used to transfer the scrubbing solution from the bermed area to a process waste drain for eventual treatment at Building 374. Based on the results of the pH measurements, no action was required.

Fate of Constituents Released to Environment

Based on the characterization results, there is no actual or potential risk to human health or the environment.

Action/No Further Accelerated Action Recommendation

Based upon the characterization sample results collected in accordance with the IASAP Addendum #IA-02-01 (DOE 2001), no potential contaminant or residual contaminant source could be identified (DOE 2003).

DOE received concurrence of NFAA status for IHSS Group 100-4 on April 22, 2003 (S H Gunderson letter to R DiSalvo).

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, CO, June

DOE, 2001, Industrial Area Sampling and Analysis Plan, Addendum IA-02-01, Rocky Flats Environmental Technology Site, Golden, CO, November

DOE 2003, Closeout Report for IHSS Groups 100-4 and 100-5, Rocky Flats Environmental Technology Site, Golden, CO, March

Gunderson, S H , letter to R DiSalvo, 2003, Final Closeout Report for IHSS Groups 100-4 and 100-5, April 22

PAC REFERENCE NUMBER: 300-128

IHSS Number 128

Operable Unit Industrial Area (former Operable Unit 13)

IHSS Group 300-1

Unit Name Oil Burn Pit No 1

Approximate Location N750,000, E2,082,000

Date(s) of Operation or Occurrence

August 18, 1956

Description of Operation or Occurrence

On August 18, 1956, an experiment was conducted that involved burning contaminated oil from Buildings 444 and 881 in an area referred to as the garage oil-burning pit. Barrels were dumped on the southern side of a pit located north of Building 331 and ignited. At one point rocks were thrown into the oil to agitate the surface to facilitate burning. Reports documenting the incident conflict upon the exact amount that was burned on that day. A Health Physics Report from 1956, which details the incident, indicates that six drums were dumped into the pit (an estimated 200 gallons). Other reports state that 10 drums of waste oil were burned.

Prior to the burning, several high-volume air samplers were started to obtain background data, however, not all the samplers were started at the same time, and several were not started for approximately one hour after the fire had been initially ignited. The report also documents the refueling and failure of a generator that was powering many of the samplers. One sampler was placed in the path of a "black plume," which was moving at a 30-degree angle and rising to a height of 40 to 100 feet. The plume moved in the general direction of Building 123.

Filters from air samplers monitoring the experiment yielded alpha radiation readings ranging from 0.1 dpm/m² to 30 disintegrations per minute per square meter (dpm/m²). The low reading was taken from the roof of Building 123, and the high reading was taken approximately 60 feet south of the burning pit directly in the smoke plume.

A direct survey was conducted of the soil and oil residue within the pit. Two spots along the southern bank of the pit where the oil was dumped had meter readings of 500 and 750 cpm alpha activity. Soil samples were collected, but the results are unknown.

After the burning operation, the residue was left in place, and the pit backfilled. It is not known when the backfilling took place. The residues were not removed prior to further construction in the area.

Physical/Chemical Description of Constituents Released

As described in IASAP Addendum #IA-02-01 (DOE 2001), PCOCs at IHSS 300-128 were determined based on process knowledge and data collected prior to the accelerated action initiated during 2002. PCOCs included uranium-238, depleted uranium (DU) and VOCs. Characterization results indicate that all soil concentrations are below the WRW ALs. Preaccelerated action and accelerated action data are presented in the Final Closeout Report for IHSS Group 300-1 (DOE 2003).

Responses to Operation or Occurrence

Notification of the planned accelerated action was provided in ER RSOP Notification #02-10 (DOE 2002), which was approved by CDPHE on October 24, 2002 (CDPHE 2002). Activities were conducted between August 27, 2002, and January 24, 2003, and involved the removal of concrete slabs, foundation walls, drain lines, and a sump associated with Building 335, and characterization. Surface and subsurface soil samples were collected and analyzed after the removal activities. Details and analytical results are provided in the Final Closeout Report for IHSS Group 300-1 (DOE 2003).

Fate of Constituents Released to the Environment

Results from the accelerated action characterization (DOE 2003), indicate that soil contaminant concentrations are less than RFCA WRW ALs. In addition, the IHSS is not located in an area susceptible to landslides or high erosion.

Action/No Further Accelerated Action Recommendation

Based on the actions taken and soil characterization results, there is no contaminant source in the IHSS, and therefore, no actual or potential risk to human health or the environment. The subsurface soil risk screen conducted as part of the accelerated action indicates that NFAA is required. There is groundwater contamination in the area, and there may be multiple potential sources of this contamination. However, the groundwater contamination is considered part of the IA Plume, and this plume and any necessary remediation (e.g., groundwater treatment system) will be evaluated in a future decision document.

No long-term stewardship activities are recommended for IHSS 300-128 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 300-128.

No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 300-128

DOE received concurrence of NFAA status for IHSS Group 300-1 on June 20, 2003
(S H Gunderson, letter, to R DiSalvo, 2003)

Comments

None

References

CDPHE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY02 Notification #02-10 Approval Letter, October 24

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol Notification #02-10, Rocky Flats Environmental Technology Site, Golden, Colorado, October

DOE, 2003, Final Closeout Report for IHSS Group 300-1, Rocky Flats Environmental Technology Site, Golden, Colorado, May

Gunderson, S H , letter, to R DiSalvo, 2003, June 20

PAC REFERENCE NUMBER: 300-134(N)

IHSS Number	134
Operable Unit	Industrial Area (former Operable Unit 13)
IHSS Group	300-1
Unit Name	Metal Disposal Site North Area (Lithium Metal Destruction Site)
Approximate Location	N750,000, E2,082,000

Date(s) of Operation or Occurrence

1963 - 1970

Description of Operation or Occurrence

Reactive metal disposal was conducted in two locations north of Building 331. The first site coincides with IHSS 134, however, the boundaries were enlarged. Detailed review of aerial photographs indicates that part of the site is now covered by Sage Avenue. The second site is located in the corner formed by the L-shape of Building 331. Part of the roof and adjacent parking lot are included.

Many documents indicate that lithium was burned in this area, however, interviews with RFETS Fire Department employees present during these activities contradict this. They indicated that although some small amounts of lithium may have been destroyed at this location, magnesium was the primary constituent of concern. Inspection of EPA aerial photographs reveals the presence of two pond-like structures roughly 250 feet north of Building 331. The westernmost pond measures 30 by 40 feet, and the eastern pond is 15 by 20 feet. Documents describing the operations indicate various-size ponds.

The area impacted by these activities lies north of Building 335. The site was originally located in a depression north of Building 331 and west of Building 553. Sage Avenue was constructed over part of this PAC during the late 1960s and early 1970s. Building 335 was built over the southern part of the site at approximately the same time.

Photographs taken in 1966 show a white residue coating the depression where the metal destruction took place. Other photos taken from a distance show a dense black cloud coming from this area. It is not known whether the smoke plume was the result of metal destruction or a grass fire, which was often caused by the burning activities.

Analyses of surface soil samples during the OU 13 Phase I RCRA RFI/RI indicated that americium-241 and plutonium-239/240 activities were detected above background. Soil gas samples were also collected and analyzed. These data are available in the IA Data Summary Report (DOE 2000).

Physical/Chemical Description of Constituents Released

As described in IASAP Addendum #IA-02-01 (DOE 2001), PCOCs at IHSS 300-134(N) were determined based on process knowledge and data collected prior to the accelerated action initiated during 2002. PCOCs included radionuclides, metals and VOCs. Characterization results indicate that all soil concentrations are less than WRW ALs. Preaccelerated action and accelerated action data are presented in the Final Closeout Report for IHSS Group 300-1 (DOE 2003).

Responses to Operation or Occurrence

Notification of the planned accelerated action was provided in ER RSOP Notification #02-10 (DOE 2002), which was approved by CDPHE on October 24, 2002 (CDPHE 2002). Activities were conducted between August 27, 2002, and January 24, 2003, and involved the removal of concrete slabs, foundation walls, drain lines, and a sump associated with Building 335, and characterization. Surface and subsurface soil samples were collected and analyzed after the removal activities. Details and analytical results are provided in the Final Closeout Report for IHSS Group 300-1 (DOE 2003).

Fate of Constituents Released to the Environment

Results from the accelerated action characterization (DOE 2003), indicate that soil contaminant concentrations are less than the RFCA WRW ALs. In addition, the IHSS is not located in an area susceptible to landslides or high erosion.

Action/No Further Accelerated Action Recommendation

Based on the actions taken and soil characterization results, there is no contaminant source in the IHSS, and therefore, no actual or potential risk to human health or the environment. The subsurface soil risk screen conducted as part of the accelerated action indicates that no further accelerated action is required. There is groundwater contamination in the area, and there may be multiple potential sources of this contamination. However, the groundwater contamination is considered part of the IA Plume, and this plume and any necessary remediation (e.g., groundwater treatment system) will be evaluated in a future decision document.

No long-term stewardship activities are recommended for IHSS 300-134(N) beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance,

and prohibitions on groundwater pumping in the area of IHSS 300-134(N) No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 300-134(N)

DOE received concurrence of NFAA status for IHSS Group 300-1 on June 20, 2003 (S H Gunderson, letter, to R DiSalvo, 2003)

Comments

None

References

CDPHE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY02 Notification #02-10 Approval Letter, October 24

DOE, 2000, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol Notification #02-10, Rocky Flats Environmental Technology Site, Golden, Colorado, October

DOE, 2003, Final Closeout Report for IHSS Group 300-1, Rocky Flats Environmental Technology Site, Golden, Colorado, May

Gunderson, S H , letter, to R DiSalvo, 2003, June 20

PAC REFERENCE NUMBER: 300-171

IHSS Number 171

Operable Unit Industrial Area (former Operable Unit 13)

IHSS Group 300-1

Unit Name Fire Department Training Ground (Solvent Burning Ground)

Approximate Location N750,000, E2,082,000

Date(s) of Operation or Occurrence

1969 to Present

Description of Operation or Occurrence

Building 335 was used for training Fire Department personnel. The original, preconstructed building was placed in an area north of Building 331 after the 1969 fire (PAC 700-150 7). Experiments took place to test heat and water effects on different types of materials (e.g., filter plenums). Filter plenum tests were conducted inside the building and provided a smoky, cramped, fire-fighting experience. One incident of burning was on June 9, 1972, when steel beams were tested in a fire by burning diesel oil in an open pit.

Other types of training included the use of a large cross-shaped pan or a smaller square pan into which diesel fuel was placed and ignited. Most of the fuel was burned during the process although some was allowed to remain in the pan and mix with rainwater. The mixture was then dumped onto the ground. RFETS Clean Water Act Division personnel conducted an inspection on December 11, 1990. The large cross-shaped pan was found to have holes in it and oil-contaminated soil was present around the pans. The contamination was thought to have spread to a nearby catch basin (storm drain) where an oily sheen could be seen on the surface of the standing water. Running water in a nearby ditch had no visible sheen.

Recent training was conducted by the use of a "tree" constructed of metal that allowed propane to escape from the "branches" of the tree. A large quantity of water was used during this process that was allowed to flow into the storm drain.

At a site visit conducted on November 21, 1991, the cross-shaped pan was present but covered. The water standing in the storm drain (catch basin) still had an oily sheen on the surface. There was no evidence of soil contamination. Building 335 had a visible black residue along the top of the large, east-facing door.

When this area was first used for training purposes, magnesium chips coated with a water-soluble material were burned Diesel fuel was the main material used, and gasoline was used to ignite the diesel fuel The firefighters may have also used waste solvents

No documentation was found, and interviewees were unaware of any type of soil removal prior to construction of Building 335 No soil or air sampling was conducted, based on the knowledge of one RFETS Fire Department employee

Analyses of soil samples during the OU 13 Phase I RFI/RI indicated that calcium, copper, iron, magnesium, sodium, nickel, and strontium concentrations were detected above background Soil gas samples were also collected and analyzed These data are available in the IA Data Summary Report (DOE 2000)

Physical/Chemical Description of Constituents Released

As described in IASAP Addendum #IA-02-01 (DOE 2001), PCOCs at IHSS 300-171 were determined based on process knowledge and data collected prior to the accelerated action initiated during 2002 PCOCs included metals, SVOCs, and VOCs Characterization results indicate that all soil concentrations are less than WRW ALs, except for one subsurface arsenic concentration The arsenic concentration at location BV42-003 (between 0.5 and 2.5 feet) was 29.3 mg/kg, and the AL is 22.2 mg/kg Preaccelerated action and accelerated action data are presented in the Final Closeout Report for IHSS Group 300-1 (DOE 2003)

Responses to Operation or Occurrence

Notification of the planned accelerated action was provided in ER RSOP Notification #02-10 (DOE 2002), which was approved by CDPHE on October 24, 2002 (CDPHE 2002) Activities were conducted between August 27, 2002, and January 24, 2003, and involved the removal of concrete slabs, foundation walls, drain lines, and a sump associated with Building 335, and characterization Surface and subsurface soil samples were collected and analyzed after the removal activities Details and analytical results are provided in the Final Closeout Report for IHSS Group 300-1 (DOE 2003)

No action was taken to remove the soil with the elevated arsenic concentration The detected concentration was in the range of background concentrations historically seen at RFETS Refer to the ER Regulatory Contact Record dated December 17, 2002 (Appendix B, DOE 2003)

Fate of Constituents Released to the Environment

Results from the accelerated action characterization (DOE 2003), indicate that soil concentrations are less than RFCA WRW ALs, with the minor exception noted above In addition, the IHSS is not located in an area susceptible to landslides or high erosion

Action/No Further Accelerated Action Recommendation

Based on the actions taken and soil characterization results, there is no contaminant source in the IHSS, and therefore, no actual or potential risk to human health or the environment. The subsurface soil risk screen conducted as part of the accelerated action indicates that no further accelerated action is required. There is groundwater contamination in the area, and there may be multiple potential sources of this contamination. However, the groundwater contamination is considered part of the IA Plume, and this plume and any necessary remediation (e.g., groundwater treatment system) will be evaluated in a future decision document.

No long-term stewardship activities are recommended for IHSS 300-171 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 300-171. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 300-171.

DOE received concurrence of NFAA status for IHSS Group 300-1 on June 20, 2003 (S H Gunderson, letter, to R DiSalvo, 2003).

Comments

None

References

CDPHE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY02 Notification #02-10 Approval Letter, October 24

DOE, 2000, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol Notification #02-10, Rocky Flats Environmental Technology Site, Golden, Colorado, October

DOE, 2003, Final Closeout Report for IHSS Group 300-1, Rocky Flats Environmental Technology Site, Golden, Colorado, May

Gunderson, S H, letter, to R DiSalvo, 2003, June 20

PAC REFERENCE NUMBER: 300-702

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	Group 300-6
Unit Name	Pesticide Shed
Approximate Location	N750,500, E2,810,500

Date(s) of Operation or Occurrence

1952 - 1988

Description of Operation or Occurrence

(Original HRR [DOE 1992])

Building 367 has been used to store pesticides and herbicides since 1952 when the first spills are assumed to have occurred. In 1988, large quantities were being stored there and the building showed signs of spills and leaks. There were no spill containment features, therefore, release of contamination to a nearby drainage ditch may have been possible.

Physical/Chemical Description of Constituents Released

(Original HRR [DOE 1992])

Large quantities of pesticides and herbicides were stored and mixed in Building 367 from 1952 to 1988. Equipment and containers were cleaned and the rinsate water was dumped onto the ground outside the building.

Responses to Operation or Occurrence

Based on historical information regarding IHSS 300-702, sampling at five surface locations was performed in accordance with IASAP Addendum #IA-02-01 (DOE 2002). Targeted compounds consisted of both pesticides and herbicides.

Fate of Constituents Released to Environment

No documentation was found that detailed the fate of constituents that may have been released from IHSS 300-702.

Action/No Further Accelerated Action Recommendation

Based upon the results of the soil samples collected, no current or potential contaminant source was identified. As shown in the Characterization Data Summary Report (DOE 2003), analytical results from the sampling event indicates that all PCOCs are less than WRW and ecological ALs as outlined in the RFCA Modification (DOE et al 2003). A Subsurface Soil Risk Screen was not required.

No long-term stewardship activities are recommended for IHSS 300-702 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 300-702. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 300-702.

DOE received concurrence of NFAA status for IHSS Group 300-6 on July 21, 2003 (S H Gunderson, letter, to R DiSalvo, 2003).

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2003, Characterization Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, July

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H, letter, to R DiSalvo, 2003, Re Final Data Summary Report, July 21

PAC REFERENCE NUMBER: 400-802

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	600-2
Unit Name	Storage Shed South of Building 334
Approximate Location	N749,000, E2,082,000

Date(s) of Operation or Occurrence

1955 - 1969

Description of Operation or Occurrence

(Original HRR [DOE 1992])

The storage area south of Building 334 was originally a metal or wooden structure built on a concrete slab. A July 1955 aerial photograph indicates that the building had been removed but the remaining slab was not being used for storage. The first documented usage of the storage area was reported on October 24, 1955, when 125 barrels of depleted uranium chips immersed in oil were stored there. The drums developed leaks that contaminated the slab. In October 1956, one or two leaking drums contaminated the slab to 537 dpm. As of November 1956, 10 to 20 drums were leaking. On November 12, 1956, a 30-gallon overturned drum spilled contaminated oil onto the slab.

The drums were completely removed and the slab cleaned as of November 28, 1956. However, it was discovered that contamination had spread to equipment that was also stored there. The equipment was moved but the slab still had smears of up to 10,000 dpm. Additional monitoring conducted in December 1956 revealed that the contamination was spreading due to weather conditions. By January 1957, low-level radioactivity had extended to the fuel storage tank located south of Building 551 (PAC 600-152).

Although documentation found indicates contaminated drums stored south of Building 334 were removed, photographs indicate storage of miscellaneous items continued at this site until 1969.

Physical/Chemical Description of Constituents Released

(Original HRR [DOE 1992])

The first drums stored on the slab contained depleted uranium chips immersed in oil
There were 125 30-gallon drums stored at the site until November 28, 1956
Perchloroethylene was used on the slab for decontamination

No documentation was found that indicated the kinds of materials stored at the site after 1956 or whether the materials were contaminated

Responses to Operation or Occurrence

Cleanup was attempted in October 1956, when the drums were first found to be leaking
The "leakers" were placed in larger drums, and contamination on the concrete slab was reduced from 537 dpm to 108 dpm using perchloroethylene The activity from the overturned drum was cleaned up and decontaminated to a "low level " The drums were moved to the "bull pen," located in part of the area covered by the 903 Pad (PAC 900-112), on November 15th and 16th, 1956 The slab where the drums were stored was cleaned on November 28, 1956

Although the slab was cleaned where the drums were stored, the area around the contaminated equipment had not been cleaned as of the end of December 1956 The equipment was moved to a production area on plant site The loose oxide was removed and the area covered with plastic to prevent spreading of activity Smears up to 9,936 dpm were collected prior to vacuuming Monitoring conducted on December 20, 1956, showed a maximum of 7,245 dpm on the slab

Activities were conducted between July 17 and August 21, 2002, in accordance with IASAP Addendum #IA-02-06 (DOE 2002a) and ER RSOP Notification 02-07 (DOE 2002b) and involved soil characterization, the removal of slabs beneath Trailers T452G and T452F and associated asphalt-paved areas

Fate of Constituents Released to Environment

No documentation was found that detailed the fate of constituents that may have been released from this storage area

Action/No Further Accelerated Action Recommendation

As shown in the Final Closeout Report (DOE 2003), analytical results indicate that all PCOCs are less than WRW and ecological receptor ALs as outlined in the RFCA Modification (DOE et al 2003)

No long-term stewardship activities are recommended for IHSS 400-802 beyond the generally applicable Site requirements that may be imposed on this area in the future Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 400-802 No specific

engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 400-802

DOE received concurrence of NFAA status for IHSS Group 600-2 on June 19, 2003 (S H Gunderson, letter, to R DiSalvo, 2003)

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 2002a, Industrial Area Sampling and Analysis Plan Addendum #IA-02-06, Rocky Flats Environmental Technology Site, Golden, Colorado, July

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol Notification 02-07, Rocky Flats Environmental Technology Site, Golden, Colorado, July

DOE, 2003, Final Closeout Report for IHSS Group 600-2, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, CDPHE and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H , letter, to R DiSalvo, 2003c, Re Final Data Summary Report, June 19

PAC REFERENCE NUMBER: 400-807

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	400-10
Unit Name	Sandblasting Area
Approximate Location	N748,000, E2,082,500

Date(s) of Operation or Occurrence

May – September 1976

Description of Operation or Occurrence

(Original HRR [DOE 1992])

No documentation could be found that details the dates that sandblasting began in the 400 Area. The first documented incident occurred in May 1976. References state that sandblasting of ATMX railcars took place "north of Building 664," "inside the fence east of 444," and "east of Building 439."

Physical/Chemical Description of Constituents Released

(Original HRR [DOE 1992])

In September 1976, Industrial Hygiene personnel initiated the substitution of alumina grit for flint sand because of its lower toxicity.

Responses to Operation or Occurrence

Based on historical information regarding IHSS 400-807, 48 locations were sampled targeting metals, radionuclides, SVOCs, and VOCs in accordance with IASAP Addendum #IA-02-01 (DOE 2002).

Fate of Constituents Released to Environment

No documentation was found that detailed the fate of constituents that may have been released.

Action/No Further Accelerated Action Recommendation

Based upon the results of the soil samples collected, no current or potential contaminant source was identified. As shown in the Data Summary Report (DOE 2003), analytical results from the sampling event shows that all PCOCs are less than WRW and Ecological Receptor ALs as outlined in the RFCA Modification (DOE et al 2003)

No long-term stewardship activities are recommended for IHSS 400-807 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 400-807. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 400-807.

DOE received concurrence of NFAA status for IHSS Group 400-10 on July 15, 2003 (S H Gunderson, letter, to R DiSalvo, 2003)

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2003, Characterization Data Summary Report for IHSS Group 400-10, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, CDPHE and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H , letter, to R DiSalvo, 2003, Final Data Summary Report for IHSS Group 400-10, July 15, 2003

PAC REFERENCE NUMBER: 500-906

IHSS Number Not Applicable

Unit Name Asphalt Surface Near Building 559

Location N750,100, E2,083,500

Date(s) of Operation or Occurrence

March 22, 1993

Description of Operation or Occurrence

On March 22, 1993 at 2 00 p m , approximately 1 gallon of F001 wastewater spilled onto the pavement from a hose that was used to extract excess water from a tanker The water was from the P304 sump, which collects water from the exterior of the Building 559/561 tunnel and the Building 561 basement Normally this water was released into the surface water drainage system through pumping to a footing drain system that flows by gravity However, the water in question was found to exceed Segment 5 stream standards for some analytes, and was thus being removed by tanker The tanker was accidentally filled beyond the level allowed by Rocky Flats Transportation Guidelines These guidelines require that no more than four-fifths of the capacity of the tanker be used After approximately 1,000 gallons of water had been off-loaded from the tanker into drums, the hose that was used leaked some water as it was transferred back to storage

Physical/Chemical Description of Constituents Released

The water contained F001 hazardous waste constituents, including carbon tetrachloride, trichloroethene and 1,1-dichloroethene, based on four sampling events that occurred from July 1992 through March 1993 Chemical analytes covered by Toxicity Characteristic Leaching Procedure (TCLP) were also identified, but the concentrations were below those of a characteristic RCRA hazardous waste Contamination levels exceeded Segment 5 stream standards for some constituents

Responses to Operation or Occurrence

Oil-dry absorbent was used to absorb the water and was managed as RCRA-regulated hazardous waste after use in a RCRA permitted storage area The incident was reported to the regulatory agencies in CPIR No 93-004, as well as the Fourth Quarterly Update to the Historical Release Report (HRR) (DOE 1993) The HRR reporting process assigned the location as PAC 500-906

The soil immediately under the asphalt surface (PAC 500-906) was sampled in April 2002 in accordance with IASAP Addendum #IA-02-01 (DOE 2001). Two soil samples were collected and analyzed for VOCs. All analytical results were less than RFCA Tier II and WRW ALs (DOE 2003).

Fate of Constituents Released to Environment

Hazardous constituents released to the environment are believed to be minimal, if any, due to the small amount of material spilled on the asphalt surface and the immediate cleanup response. The characterization sampling described above confirms that VOCs did not reach the underlying soil horizon.

Action/No Further Action Recommendation

Based upon the characterization results presented in the Data Summary Report for IHSS Group 500-6 (DOE 2003), soil concentrations are below RFCA Tier II and WRW ALs for the potential contaminants of concern and no contaminant source could be identified.

DOE received concurrence of NFAA status for IHSS Group 500-6 on July 16, 2003 (S H Gunderson, letter, to R DiSalvo, 2003).

Comments

In relation to this incident, the October 2000 renewal of the National Pollutant Discharge Elimination System Permit contains provisions that currently allow for the discharge of this groundwater (with restriction to volume and contaminant concentration) to the sanitary collection system (EPA 2000).

References

DOE, 1993, Fourth Quarterly Update to the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01 Rocky Flats Environmental Technology Site, Golden, CO, November

EPA, 2000, Renewal of the National Pollutant Discharge Elimination System (NPDES) Permit, No #CO0001333, Rocky Flats Environmental Technology Site, Golden, CO, October

DOE, 2003, Data Summary Report for IHSS Group 500-6, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H, letter, to R DiSalvo, 2003, Final Data Summary Report for IHSS Group 500-6, July 16, 2003

PAC REFERENCE NUMBER: 500-907

IHSS Number 172

Operable Unit Industrial Area

IHSS Group 500-7

Unit Name Tanker Truck Release of Hazardous Waste from Tank 231B

Approximate Location N750,000, E2,083,000

Date(s) of Operation or Occurrence

July 20, 1994

Description of Operation or Occurrence

(HRR [DOE 1992])

At approximately 9 30 am on July 13, 1994, during a RCRA tank inspection, evidence of a release was observed near Building 231. At the time of the discovery, sludge was being transferred from Tank 231B to a tanker truck in an effort to lower the level of sludge in the stationary tank for a valve repair job. Approximately 5 pound of dried sludge was released to a secondary containment spill basin when a hose coupling was unlocked. It was estimated that more than 1 pound of liquid was sprayed onto two workers and adjacent soil both east and west of the spill basin. The workers were taken to Building 374 and decontaminated in accordance with the DOE Radiological Control Manual requirements and implementation procedures. Nasal swipes were collected from the workers and counted for radiological contamination. Subsequent internal dose calculations for one of the workers confirmed a 12 millirem exposure which is considered a negligible dose over a 1-year time frame. The second worker showed no measurable contamination from the swipes. Radiological surveys of the surrounding soil and basin area were conducted using a Bicron and SAC-4 instrument. The highest detected level of radioactive contamination was 651 dpm. Contaminated soil was containerized and the basin area decontaminated.

Physical/Chemical Description of Constituents Released

(HRR [DOE 1992])

The material released from tanker truck No 6 on July 20, 1994, was rinse water used to flush the transfer line and tanker drain hose. The sludge from the tanker contained an F-

listed waste, therefore the rinse water was being treated as a hazardous waste under the mixture rule. The EPA waste codes assigned to the waste contained in the 231 tank system include D004, D006, D007, D008, D009, D010, D011, F001, F002, F003, F005, F006, F007, F009, and F039. No residual contamination was detected in preliminary samples.

Responses to Operation or Occurrence

The area was cordoned off and posted immediately due to the radiological contamination. A wet vacuum was used to remove the liquid from the spill basin, and radiological control technicians (RCTs) smeared the tanker and the basin area. Approximately 30 pounds of soil was removed on July 13, 1994 from the first release, followed by an additional 40 pounds of soil from the second release on July 20 and 21, 1994. The soil was containerized in a drum and was managed as low-level mixed hazardous waste RCRA Unit 200.

The RCRA CPIR was initiated on July 20, 1994, as a conservative measure, due to the release from containment to the environment of approximately 1 pound of hazardous waste. Samples were collected from the wet vacuum, the tanker drain hose, and surrounding soils (prior to and after excavation).

Based on historical information regarding the tanker truck release, soil was sampled for radionuclides, metals, VOCs, SVOCs, PCBs, and pH in November 2002, in accordance with IASAP Addendum #IA-02-01 (DOE 2001). Surface soil samples were collected from 5 locations within IHSS 172 and these locations and analytical data are presented in the Group 500-7 Data Summary Report (DOE 2003).

Fate of Constituents Released to Environment

Approximately 70 pounds of soil were removed from the areas of the release and was managed as low-level mixed hazardous waste. Preliminary analytical data and monitoring indicate that contaminants were adequately cleaned up.

Based on the characterization sampling results presented in the Data Summary Report for IHSS Group 500-7 (DOE 2003), there does not appear to be any actual or potential risk to human health or the environment. There were no analytical results above the RFCA WRW ALs.

Action/No Further Accelerated Action Recommendation

Based upon the results of the soil samples collected, no current or potential contaminant source was identified. PCOCs for this site were not detected above the RFCA ALs (DOE et al 2003).

No long-term stewardship activities are recommended for IHSS 500-907 beyond the generally applicable Site requirements that may be imposed on this area in the future.

Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 500-907. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 500-907.

DOE received concurrence of NFAA status for IHSS Group 500-1 on June 9, 2003 (S H Gunderson, letter, to J Legare, 2003)

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 2001, Industrial Area Sampling and Analysis Plan Fiscal Year 2002, Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2003, Data Summary Report for IHSS Group 500-7, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, CDPHE and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H, letter, to J Legare, 2003, Approval of Data Summary Report, IHSS Group 500-7, June 9

PAC REFERENCE NUMBER: 600-120.2

IHSS Number 120 2

Operable Unit Industrial Area (former Operable Unit 12)

IHSS Group Group 400-10

Unit Name Fiberglassing Area West of Building 664

Approximate Location N748,250, E2,082,650

Date(s) of Operation or Occurrence

1972 - 1979

Description of Operation or Occurrence

(Original HRR [DOE 1992])

Fiberglassing of waste packing boxes occurred in the areas north and west of Building 664 during the 1970s. It is possible that residual chemical constituents are present resulting from the packaging activities.

Interviewees for the CEARP indicated that a spill of polyester resin might have occurred west of Building 664 during 1978 or 1979. Foam was sprayed on the ground, indicating that something was being contained. Interviewees also recalled fiberglass and epoxy components, as well as solvents, being spilled west of Building 664. Similar spills may have occurred north of Building 664.

The Aerial Radiological Measurements System survey, conducted in 1977, detected elevated gamma radiation and americium concentrations in the vicinity of these sites. No documentation was found that provided an explanation for the origin of the elevated readings.

No documentation was found that detailed discrete occurrences in these areas.

Physical/Chemical Description of Constituents Released

(Original HRR [DOE 1992])

Persons interviewed for the CEARP Phase 1 report indicated that the area may contain residue from spills of polyester resin, peroxide catalyst materials, and cleaning solvents.

Plutonium- and uranium-contaminated liquid and solid wastes staged in Building 664 are the likely residual constituents that led to the elevated radiation readings in 1977

Responses to Operation or Occurrence

Based on historical information regarding IHSS 600-120 2, soil samples were collected from 48 locations targeting metals, radionuclides, SVOCs, and VOCs in accordance with the IASAP Addendum #IA-02-01 (DOE 2002)

Fate of Constituents Released to Environment

No documentation was found that detailed the fate of constituents that may have been released from IHSS 600-120 2

Action/No Further Accelerated Action Recommendation

Based upon the results of the soil samples collected, no current or potential contaminant source was identified. As shown in the Data Summary Report (DOE 2003), analytical results from the sampling event all PCOCs are less than RFCA ALs as outlined in RFCA Attachment 5 (DOE et al 2003)

No long-term stewardship activities are recommended for IHSS 600-120 2 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 600-120 2. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 600-120 2.

DOE received concurrence of NFAA status for IHSS Group 400-10 on July 15, 2003 (S H Gunderson, letter, to R DiSalvo, 2003c)

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2003, Characterization Data Summary Report for IHSS Group 400-10, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H , letter, to R DiSalvo, 2003, Re: Final Data Summary Report for IHSS Group 400-10, July 15, 2003

PAC REFERENCE NUMBER: 600-161

IHSS Number	Not Applicable
Operable Unit	Industrial Area (former Operable Unit 14)
IHSS Group	400-10
Unit Name	Radioactive Site West of Building 664
Approximate Location	N748,000, E2,082,500

Date(s) of Operation or Occurrence

1971 - 2002

Description of Operation or Occurrence

(Original HRR [DOE 1992])

Persons interviewed for the CEARP Phase 1 report indicated that the area west of Building 664 may contain low-level residual contamination from plutonium and uranium resulting from punctured or leaking drums and boxes of solid and liquid wastes. Building 664 was constructed in 1971 and is used to stage drummed and boxed waste prior to offsite shipment for disposal.

A review of aerial photographs revealed no apparent activity in the area prior to the construction of Building 664 in 1971. No records documenting discrete releases in this area were found. Results of an aerial radiometric survey conducted in 1977 indicate an area of elevated americium and gamma activity concentrations centered around the area of the northwest corner of Building 664. In November 1988, a forklift leaked hydraulic oil outside Building 664. The cause was the rupture of a 1-inch hose on the forklift. The oil spread over the asphalt area and adjacent ground.

Physical/Chemical Description of Constituents Released

Plutonium- and uranium-contaminated liquid and solid wastes staged in Building 664 are the likely residual constituents that led to the elevated radiation readings in 1977.

The November 1988 incident resulted in the release of liquid hydraulic oil.

Responses to Operation or Occurrence

Soil was reportedly removed from this area in the early 1970s. No documentation was found that provides details of any soil remediation activities.

An oil absorbent was spread over the oil that remained from the November 1988 incident.

Based on historical information regarding IHSS 600-161, 48 sampling locations targeting metals, radionuclides, SVOCs, and VOCs were performed in accordance with IASAP Addendum #IA-02-01 (DOE 2002).

Fate of Constituents Released to Environment

This IHSS was studied in accordance with the IAG schedule for OU 14. However, information gathered for the HRR indicates that the location for this IHSS is inaccurate (see Comments). The IAG activities included site investigation and characterization. The Final Phase I RFI/RI Report was not completed.

Additional characterization was conducted in accordance with IASAP Addendum # IA-02-01 (DOE 2002).

Action/No Further Accelerated Action Recommendation

Based upon the results of the soil samples collected, no current or potential contaminant source was identified. As shown in the Data Summary Report (DOE 2003), analytical results from the sampling event shows that all PCOCs are less than WRW and Ecological ALs as outlined in the RFCA Modification (DOE et al 2003).

No long-term stewardship activities are recommended for IHSS 600-161 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 600-161. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 600-161.

DOE received concurrence that NFAA is necessary for IHSS Group 400-10 on July 15, 2003 (S H Gunderson, letter to R DiSalvo, 2003).

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2003, Data Summary Report for IHSS Group 400-10, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H , letter, to R DiSalvo, 2003, Re Final Data Summary Report for IHSS Group 400-10, July 15

PAC REFERENCE NUMBER: 600-1001

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	600-1
Unit Name	Temporary Waste Storage Building 663
Approximate Location	N749,000, E2,083,000

Date(s) of Operation or Occurrence

May 1954 - 1971

Description of Operation or Occurrence

The Austin Construction Company constructed two temporary buildings on concrete slabs by for use during original Plant construction activities in the early 1950s. These buildings were located where Building 662 and Building 663 were recently located. The wooden structures were removed prior to 1954, but the concrete slabs remained. The slabs from Buildings 662 and 663, as well as the area around them, were used for storage purposes.

In April 1954, it was proposed that the Building 663 slab be used for temporary storage of non-combustible waste awaiting disposal. It is believed, from HRR research, that the slab is also known as the East Slab, because it is located both east of Building 334 (which also had a storage slab), and Building 444, where most of the waste stored at Building 663 came from.

The area was found to be an advantageous loading area, and plans were made to convert the slab into a loading facility. On May 25, 1955, approval was requested for the conversion of the slab east of the Building 663 slab, which is the current location of Building 662, to a loading facility. The northern end of the loading facility was reinforced and refinished with concrete in October 1958. On October 14, 1960, a waste storage building was erected on the Building 663 slab. Accumulated drums of waste from the production buildings were moved to the building upon completion of construction. In November 1962, drums and boxes of waste from Buildings 771 and 774 were moved to the western side of Building 663 for outside storage.

Documented releases occurring at these storage areas include the following

- On November 16 and 17, 1954, 59 drums of contaminated wastes were moved from the concrete slab (Building 663) to the Mound Site for burial (PAC 900-113) At this time, many drums were found to be in poor condition Drums of liquid wastes, which had been placed at the storage area in April 1954, had corroded and developed leaks The southern side of the concrete slab was contaminated as a result of the pinhole leaks
- On September 5, 1958, a drum containing highly contaminated coolant was punctured on the East Slab As a result, the slab was contaminated up to greater than 100,000 cpm direct reading, and up to 20,000 cpm removable contamination Routine smear surveys conducted at the East Slab in August 1959 indicated a maximum reading of 108 dpm, and an average reading of 16 dpm The high reading was taken from a roped-off area of the slab Spot checks indicated direct readings of 100,000 cpm in this area No documentation was found that explained why the area was roped off
- Routine smear surveys conducted on the East Slab in March 1960 indicated a maximum reading of 1,734 dpm, and an average reading of 67 dpm Also, 59 drums at the East Slab were surveyed, resulting in a maximum beta-gamma reading of 0.4 mr/hr Additionally, during March 1960, the lids of two waste drums from Building 883 came loose, resulting in contamination of approximately 2 square feet of slab, to 3,000 cpm, with solid material Additionally, a waste drum from Building 881 was found to be leaking Direct readings up to 300 cpm were found During May 1960, three waste drums from Building 881 were found to be leaking The drums were returned Apparently, acidic waste material was being released from the corroded drums and contaminating the loading facility
- Routine smear surveys conducted on the East Slab in June 1960 indicated a maximum reading of 126 dpm and an average reading of 21 dpm During June 1960, a drum from Building 881 leaked on the East Slab The drum was returned, and no contamination was found on the slab
- Routine smear surveys conducted on the East Slab in August 1961 indicated a maximum reading of 24 dpm, and an average reading of 6 dpm During August 1961, leaking drums from Building 444 and Building 776 were monitored many times No contamination was found
- During loading operations on March 19, 1963, a leaking drum was discovered The liquid was determined to be radioactive The ground, forklift, and trailer were contaminated The contents of the drum and the quantity released were not documented On March 26, 1963, a leaking waste drum in the area outside of Building 663 resulted in the contamination of a forklift, truck trailer, cross bar, lining in a truck trailer, the forklift operator, a laborer and the ground Other documentation states that during loading operations in March 1963, three "leakers" were discovered The trailers, two forklifts, the work area, and personal clothing were contaminated It is unknown whether these two reports discuss the same incident or two separate

incidents No documentation regarding the contents of the drums or the extent of ground contamination was found for either case

- A waste drum leak on September 17, 1963, contaminated a fork truck, panel truck, and semi-trailer at Building 663 No documentation was found that detailed the contents of the drum or release to the environment
- On January 12, 1990, there was a gasoline spill on the east side of Building 662 The gasoline was leaking from a truck The problem was corrected

In addition to these releases, on June 23, 1997, while conducting a surveillance walkdown of the Building 663 Laydown Yard (PAC 600-1001), two oil-stained areas were identified on the soil immediately west of the building The first stained area was approximately 10 feet west of the southwest corner of the building where a 5-gallon bucket containing an oil-water mixture had overflowed due to recent rain Stained soil around the bucket indicated that overflowing of the bucket had been ongoing for several years During the assessment of the first finding, a second oil stain was identified approximately 100 feet north of the first, where an abandoned piece of equipment was observed leaking what appeared to be hydraulic fluid onto the ground (soil) Radiological surveys were conducted at both sites followed by soil sampling and sampling of the unknown oil in the 5-gallon bucket The bucket and contents were placed into an overpack container and both oil-stained areas were immediately cleaned up in accordance with plant procedures

Physical/Chemical Description of Constituents Released

Constituents that may have been present due to storage activities include oil, still bottoms, perclene, waste coolant, and solids Gasoline was released during the January 1990 incident With respect to the June 23, 1997, identification, independent sampling was conducted from both of the soil stained areas and the liquid remaining in the bucket for analysis of oil, radiological screens, isotopic analysis (plutonium, uranium, americium), TCLP metals, VOAs, and PCBs Laboratory analysis of the soil from both locations found undetected or equivalent to background concentrations for all parameters analyzed Positive results for several compounds were identified in the liquid sample

Responses to Operation or Occurrence

With the exception of the June 23, 1997, occurrence, detailed descriptions of the response to operation or occurrence are provided in the original HRR (DOE 1992) In response to the June 23, 1997, occurrence, the individual conducting the walkdown immediately notified supervision, the Shift Manager, and the RFETS Fire Department The HAZMAT Team and Shift Superintendent responded to the site and initial radiological screening was conducted Samples were collected from the liquid in the bucket and both soil areas Gravel and soil from the two sites were containerized per plant procedure and transported to a RCRA-permitted storage facility

Activities were conducted between August 5 and October 10, 2002 in accordance with the IASAP Addendum #IA-02-01 (DOE 2002a) and ER RSOP Notification 02-04 (DOE 2002b), and involved soil characterization, the removal of the Building 662 and 663 slabs and associated concrete-paved areas. Removal activities were consistent with and contributed to the ER RSOP overall long-term remedial action objectives (RAOs) for RFETS soil (DOE 2002c).

Fate of Constituents Released to Environment

With the exception of the June 23, 1997, occurrence, no documentation was found that detailed the fate of the constituents released to the environment. Sampling and analysis adequately characterized the compounds associated with the oil in the bucket and stained soil in both areas. The area was immediately cleaned up in accordance with plant procedures and the soil was containerized prior to transporting to a RCRA-permitted storage facility. In addition, the bucket and contents were overpacked prior to removal. There were no other contaminants associated with the release and the spill was verified for cleanup. The fate of constituents and associated risk to environment from this release are considered minimal.

Action/No Further Accelerated Action Recommendation

Based upon the analytical results, accelerated action activities, and a (SSRS) conducted for IHSS Group 600-1, results indicate that NFAA is required for this site (DOE 2003).

No long-term stewardship activities are recommended for IHSS 600-1001 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 600-1001. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 600-1001.

DOE received concurrence of NFAA status for IHSS Group 600-1 on June 24, 2003 (S H Gunderson, letter, to R DiSalvo, 2003).

Comments

Photographs of the slab in 1959 clearly show significant cracks in the concrete and circular rings where drums had been stored. Photographs taken of the Building 663 floor during a site visit in December 1991 show similar cracks in the concrete, as well as circular stains where drums had been stored. This crack was investigated and the soil beneath the crack was removed. Building 663 was used for nonhazardous equipment storage.

The June 23, 1997, release did not result in any injury or potential hazard to human health or the environment.

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 2002a, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol Notification 02-04, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2002c, Environmental Restoration RFCA Standard Operating Protocol, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2003, Closeout Report for IHSS Group 600-1, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H , letter to R DiSalvo, 2003, Final Data Summary Report, June 24

PAC REFERENCE NUMBER: 600-1005

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	600-6
Unit Name	Former Pesticide Storage Area
Location	N749,000, E2,083,000

Date(s) of Operation or Occurrence

Approximately 1982

Description of Operation or Occurrence

Building 667 was originally used to store pesticides. This site is located several hundred feet north of former Building 850 in what is currently the 881 parking lot. In approximately 1982, it is believed that the original pesticide shed (Building 667) was relocated to an area southwest of Building 371 (refer to Plate 4, Appendix 4). At this new location, the building was renamed Building 367, and pesticide storage in the shed resumed for an unknown time. The shed is no longer used for pesticide storage.

It is assumed that pesticides and herbicides were stored at the Building 667 site at least through 1978. It is possible that pesticides and/or herbicides were spilled during loading or mixing operations (DOE 1992). In addition, it is possible that the floor at the prior building location was once dirt, increasing the possibility of residual amounts of pesticides remaining at the site. No known rinsing of pesticide containers occurred at the shed.

Physical/Chemical Description of Constituents Released

Pesticides, which are regulated under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), were stored in this area. It is possible that some pesticides were released to the environment. A list of pesticides stored in Building 667 follows:

Spectracide 600 (ant killer),
Mouse Maze (poisoned grain for mice and pigeons),
Bee Bopper (bee and wasp spray, includes chlordane),
Malkill (insecticide),

Hyvar X-L (Bromacil weed killer),
Esteron 76BE (herbicide weed control),
Tordon 22K (herbicide weed control),
Ureabor (U S Borax granular weed and grass control),
Banvel,

TMTD-Rhoplex (rabbit and deer repellent),
Decon rodent poison grain,
Ortho Liquid Iron (grass fertilizer),
Excel (lawn fertilizer),
DM14 (herbicide weed control),

Diazon,
Poison Grain (birds),
Malathion, and
Diazinon (black widow spider)

Responses to Operation or Occurrence

The former Building 667 location was introduced in to the HRR system and former Operable Unit 10 in 1991. Specifically, there are no known or documented accounts of a herbicide or pesticide release to the environment, however, interviews with several plant employees stated that mixing of those compounds was fairly common practice in the shed. The pesticide shed was relocated to its present location (currently PAC 300-702) in 1982.

In accordance with IASAP Addendum #IA-02-01 for IHSS Group 600-6 (DOE 2001), characterization samples were collected on April 8, 2002. Analytical results for herbicides and pesticides from two locations were all below the MDLs. Analytical results for characterization samples for PAC 600-1005 are presented in the Data Summary Report for Group 600-6 (DOE 2003).

Fate of Constituents Released to Environment

There has never been a documented release from activities performed at Building 667. Further, based upon the characterization sampling results, there does not appear to be any actual or potential risk to human health or the environment. All soil concentrations were below RFCA Tier II and WRW ALs and specifically, below MDLs.

Action/No Further Action Recommendation

Based upon characterization sample results collected in accordance with the IASAP Addendum #IA-02-01 for IHSS Group 600-6 (DOE 2001), no potential contaminant source could be identified.

DOE received concurrence of NFAA status for IHSS Group 600-6 on May 15, 2003 (S H Gunderson, letter, to R DiSalvo, 2003).

Comments

Building 667 was relocated from the B881 parking lot to make room for additional parking spaces.

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, CO, June

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2003, Data Summary Report for Group 600-6, PAC 600-1005, Rocky Flats Environmental Technology Site, June

Gunderson, S H , letter to R DiSalvo, 2003, Final Data Summary Report, May 15

PAC REFERENCE NUMBER: 700-150.6 AND 700-150.8

IHSS Number	150 6 and 150 8
Operable Unit	Industrial Area (former Operable Unit 8)
IHSS Group	700-7
Unit Name	Radioactive Site South of Building 779 (150 6) and Radioactive Site Northeast of Building 779 (150 8)
Approximate Location	N750,000, E2,084,000 (150 6) N751,000, E2,084,500 (150 8)

Date(s) of Operation or Occurrence

June 1969

Description of Operation or Occurrence

In June 1969, radioactive contamination occurred due to an improperly opened waste drum in Building 779, and was spread by pedestrians tracking the contamination to areas east (IHSS 700-150 8) and south (IHSS 700-150 6) of the building (DOW 1974) (Figure 2 8) The drum was being cut apart near a dock at Building 779, and it contained residual oil with radionuclides (DOE 1995) The main dock for Building 779 was located along the northern half on the eastern side of the building Although the exact pathway along which workers walked is unknown, it is known that the buildings's south entrance was also contaminated It is unclear whether workers got from the dock to the south entrance by walking inside the building, or by walking outside and around the building The surface outside the building was mostly paved, and was heavily used by pedestrian traffic (DOE 1995)

Physical/Chemical Description of Constituents Released

The release consisted of radionuclides from radioactive waste Contamination was measured at up to 50,000 dpm/100 cm² for gross alpha activity

Responses to Operation or Occurrence

Contaminated soil was placed in barrels and removed for off-site disposal (DOW 1974)

It is not known whether all areas affected by this incident were included in cleanup activities. It is also not known if the removal of soil was in response to the incident described above or a separate incident (DOE 1995)

Fate of Constituents Released to Environment

No documentation was found which detailed the complete removal of contamination. These IHSSs were investigated in accordance with the RFI/RI Work Plan for Operable Unit 8, 700 Area (DOE, 1994), which included visual observations, radiological surveys (i.e., high purity germanium [HPGe] and sodium iodide [NaI] surveys), and surface soil and sediment sampling. The surface soil samples were collected beneath paved areas and in unpaved areas.

IHSSs 700-150 6 and 150 8 have been adequately characterized through implementation of the RFI/RI Work Plan for Operable Unit 8. Figures 2 9 and 2 10 show the surface and subsurface soil sampling locations. As can be seen from these figures, the surface soil sampling coverage is very good, but subsurface soil at IHSS 700-150 6 was not sampled, and at IHSS 700-150 8, there was only one borehole (43593) where subsurface soil was sampled. Subsurface soil was sampled at this borehole because the borehole was drilled to install well 43593 as part of the SEP investigation. The borehole was just north of IHSS 700-150 8. Subsurface soil was not extensively sampled as part of the RFI/RI Work Plan for Operable Unit 8 because the contaminant release was pedestrian traffic spreading radionuclides at the surface in an area that was mostly paved, i.e., subsurface soil contamination was not expected.

Table 2 13 summarizes the sample analysis program at IHSSs 700-150 6 and 700-150 8 based on current available data collected during the previous investigations. As can be seen, surface soil samples were primarily analyzed for metals, radionuclides, and semi-volatile organic compounds (SVOCs), although there were also some pesticide and polychlorinated biphenyl (PCB) analyses at IHSS 700-150 8. Volatile Organic Compounds (VOCs) were not analyzed because they were expected to have been volatilized in near surface soil. Subsurface soil in borehole 43593 was analyzed for metals, radionuclides, and VOCs.

The surface and subsurface soil data are summarized in Tables 2 14 and 2 15, respectively. These tables show analytes that were detected above background (see discussion below). In these tables, the following decision rules were applied to the calculation of summary statistics:

- Data rejected during validation was eliminated from the data set before computing statistics
- The maximum value is the highest detected value observed
- The average was computed using only data that are above background concentrations

Table 2.13
Analytical Program Summary

THSS 150.6											
Surface Soil						Subsurface Soil					
Metals	Radionuclides	VOCs	SVOCs	Pesticides	PCBs	Metals	Radionuclides	VOCs	SVOCs	Pesticides	PCBs
SS809193	SS809193		SS809193								
SS809393	SS809393		SS809393								
SS809493	SS809493		SS809493								
SS809593	SS809593		SS809593								
THSS 150.8											
43593	43593		43593	43593	43593	43593	43593	43593			
SS802493	PCB-29		SS802493	SS481194	PCB-29						
SS802793	SS481194		SS802793		SS481194						
SS802893	SS802493		SS802893								
SS803093	SS802793		SS803093								
SS808693	SS802893		SS808693								
SS808793	SS803093		SS808793								
SS808893	SS808693		SS808793								
SS808993	SS808793		SS808893								
SS809093	SS808893		SS808993								
SS809193	SS808993		SS809093								
SS809293	SS809093		SS809193								
SS809393	SS809193		SS809293								
SS809493	SS809293		SS809393								
	SS809393		SS809493								
	SS809493										

Table 2.14
Surface Soil Contamination Summary

Analyte Group	Analyte	Total Number Samples Analyzed	Detection Frequency	IHSS 150.6			Background Mean Plus 2SD	Wildlife Refuge Worker AL	Ecological Receptor AL	Unit
				Average Concentration	Maximum Concentration					
Metal	Copper	3	33 33%	18 4	18 4		18 05999947	40900	-	mg/kg
Radionuclide	Americium-241	3	33 33%	0 057	0 057		0 022700001	76	1900	pci/g
Radionuclide	Plutonium-239/240	3	33 33%	0 28	0 28		0 066	50	3800	pci/g
SVOC	bis(2-Ethylhexyl)phthalate	3	33 33%	76	76		-	1970000	-	ug/kg
SVOC	Di-n-butylphthalate	3	33 33%	150	150		-	73700000	-	ug/kg
SVOC	Di-n-octylphthalate	3	33 33%	44	44		-	14700000	-	ug/kg
SVOC	Fluoranthene	3	33 33%	65	65		-	27200000	-	ug/kg
SVOC	Pyrene	3	33 33%	57	57		-	22100000	-	ug/kg
IHSS 150.8										
Metal	Cadmium	8	12 50%	2 9	2 9		1 61	962	-	mg/kg
Metal	Copper	8	62 50%	40 12	106		18 06	40900	-	mg/kg
Metal	Iron	8	12 50%	20900	20900		18037 00	307000	-	mg/kg
Metal	Manganese	8	12 50%	468	468		365 08	3480	-	mg/kg
Metal	Strontium	8	12 50%	50 7	50 7		48 94	613000	-	mg/kg
Metal	Zinc	8	25 00%	310 8	544		73 76	307000	-	mg/kg
Radionuclide	Americium-241	8	50 00%	0 237	0 4		0 02	76	1900	pci/g
Radionuclide	Plutonium-239/240	8	50 00%	1 57	2 6		0 07	50	3800	pci/g
SVOC	Benzo(a)anthracene	9	11 11%	69	69		-	34900	800000	ug/kg
SVOC	Benzo(a)pyrene	9	11 11%	86	86		-	3490	25700	ug/kg
SVOC	Benzo(b)fluoranthene	9	11 11%	150	150		-	34900	1010000	ug/kg
SVOC	Benzo(k)fluoranthene	9	11 11%	190	190		-	349000	1010000	ug/kg
SVOC	bis(2-Ethylhexyl)phthalate	9	44 44%	79	120		-	1970000	-	ug/kg
SVOC	Butylbenzylphthalate	9	22 22%	465	760		-	147000000	-	ug/kg
SVOC	Chrysene	9	11 11%	89	89		-	3490000	-	ug/kg
SVOC	Di-n-butylphthalate	9	22 22%	40	41		-	73700000	-	ug/kg
SVOC	Fluoranthene	9	33 33%	69	130		-	27200000	-	ug/kg
SVOC	Indeno(1,2,3-cd)pyrene	9	11 11%	70	70		-	34900	-	ug/kg
SVOC	Pyrene	9	11 11%	140	140		-	22100000	-	ug/kg
Above the WRW or Ecological Receptor AL										

Table 2.15
Subsurface Soil Contamination Summary

		IHSS 150.8*							
Analyte Group	Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2SD	Wildlife Refuge Worker AL	Ecological Receptor AE	Unit
Metal	Manganese	1	100 00%	1000 00	1000	365 08	3480	-	mg/k g
Radionuclide	Americium-241	1	100 00%	4 00	4	0 02	76	1900	pci/g
Radionuclide	Plutonium-239/240	1	100 00%	25 00	25	0 07	50	3800	pci/g
VOC	Methylene chloride	3	66 67%	18 50	25	-	2530000	39500	ug/kg
VOC	Toluene	3	100 00%	42 67	70	-	31300000	128000	ug/kg
Above the WRW or Ecological Receptor AL									

*Subsurface soil analytical data was not collected at IHSS 150 6

Figures 2 11 and 2 12 show, for surface and subsurface soil, respectively, all the data that were detected above background, and that have a RFCA AL (WRW or Ecological Receptor) The ALs are derived from RFCA Attachment 5, dated June 5, 2003 Background levels for inorganic constituents for subsurface soil are from the Background Geochemical Characterization Report (DOE 1993) Background values for surface soils and sediments are from Geochemical Characterization of Background Surface Soils Background Soils Characterization Program (DOE 1995b) All background values used for comparison are the mean background value plus two standard deviations Any detection of an organic compound is considered an above background level observation

Surface Soil Assessment

As shown in Table 2 14 and Figure 2 11, metals, radionuclides, and SVOCs were detected above background in surface soil at many locations throughout IHSSs 150 6 and 150 8 However, in all cases, concentrations were well below the WRW ALs Lead concentrations exceeded the Ecological Receptor AL at SS808893 and SS809293, however, in both cases the concentrations were below background for surface soil (Figure 2 14)

Stewardship Evaluation

The data indicate that NFAA is necessary for protection of public health and the environment because analyte concentrations in both surface and subsurface soil are below the WRW and Ecological Receptor ALs Also, the IHSSs do not appear to be a source for the groundwater contamination in the area, and the existing contamination will be addressed in the Groundwater Plumes IM/IRA Accordingly, near-term and long-term stewardship actions are not necessary for these IHSSs However, because these IHSSs are within the IA, both near-term and long-term stewardship actions have been recommended They are discussed below

Near-Term Management Recommendations

Near-term recommendations for environmental stewardship include the following

- Excavation at the sites will continue to be controlled through the Site Soil Disturbance Permit process, and
- Site access and security controls will remain in place pending implementation of long-term controls

Long-Term Stewardship Recommendations

Based on remaining environmental conditions at IHSSs 700-150-6 and 700-150 8, no specific long-term stewardship activities are recommended beyond the generally applicable Site requirements that may be imposed on this area in the future, which are dependent upon the final remedy selected. Institutional controls that will be used as appropriate for this area include the following:

- Prohibitions on construction of buildings,
- Restrictions on excavation or other soil disturbance, and
- Prohibitions on groundwater pumping in the area

These specific long-term stewardship recommendations will also be summarized in the Rocky Flats *Long Term Stewardship Strategy*. No engineered controls, environmental monitoring, or physical controls (e.g., fences) are recommended as a result of the conditions remaining at IHSSs 700-150-6 and 700-150 8.

IHSS 700-150-6 and 700-150 8 will be evaluated as part of the Sitewide CRA, which is part of the RFI/RI and CMS/FS that will be conducted for the Site. The need for and extent of long-term stewardship activities will be reanalyzed in RFI/RI and CMS/FS and will be proposed, as appropriate, as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in the CAD/ROD, in any post-closure CHWA permit that may be required, and in any post-RFCA agreement.

NFAA Summary

IHSS 700-150-6 and 700-150 8 are proposed for NFAA. Analyte concentrations are below the WRW and Ecological Receptor ALs. Therefore, it is concluded through application of the Subsurface Soil Risk Screen that no further accelerated action is required at IHSSs 700-150-6 and 700-150 8.

References

DOE, 1994 RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan for Operable Unit 8, 700 Area, Rocky Flats Plant, Golden Colorado

DOE, 2002, 2001 Annual RFCA Groundwater Monitoring Report, November 2002

DOW, 1974 Environmental Inventory, A Historical Summation of Environmental Incidents Affecting Soils at or Near the U S AEC Rocky Flats Plant, DOW Chemical USA, January

PAC REFERENCE NUMBER: 700-1106

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	700-12
Unit Name	Process Waste Spill – Portal 1
Location	N750,000, E2,084,000

Date(s) of Operation or Occurrence

November 1986

Description of Operation or Occurrence

Approximately 10 gallons of process wastewater spilled from a tank truck at the entrance to Portal 1. The truck was en route from the Valve Vault 12 leak area to SEP 207A (Building 762A). The tank was overfilled, and the liquid splashed out of the top manhole while the truck was driven around a corner.

Physical/Chemical Description of Constituents Released

Process wastewater from the Valve Vault 12 leak was released onto the street. Analysis of water samples collected from Valve Vault 12 and a related process waste line leak indicated the total alpha activity was 170,000 pCi/L and uranium-238 activity was 120,000 pCi/L. It was determined at the time of the spill that there was no radioactivity on the street.

Responses to Operation or Occurrence

Samples were collected from Valve Vault 12 to assess the potential contamination released during the transport (noted above and provided in the PAC 300-186 narrative). Radiological surveys concluded at the time of the spill concluded that there was no radioactivity on the street. No other historical documentation could be found which further detailed a response to the release.

In accordance with the IASAP Addendum #IA-02-01 for IHSS Group 700-12 (DOE 2001), characterization samples were collected on April 4, 2002. Analytical results for radionuclides from two locations were well below RFCA Tier II and WRW ALs and were consistent with known background values. Analytical results from characterization

samples for PAC 700-1106 are presented in the Data Summary Report for Group 700-12 (DOE 2003)

Fate of Constituents Released to Environment

Because the release was relatively small (10 gallons), to an asphalt surface, and no radioactivity could be found, this incident has not posed a potential risk to human health or the environment. Recently collected analytical data support this fact (DOE 2003).

Action/No Further Action Recommendation

Based on the actions taken and characterization results for soil samples collected in accordance with the IASAP Addendum #IA-02-01, IHSS Group 700-12 (DOE 2001), no potential contaminant source or remnant concentrations could be identified for PAC 700-1106. All soil concentrations were below RFCA Tier II and WRW ALs (DOE 2003).

DOE received concurrence of NFAA status for IHSS Group 700-12 on May 15, 2003 (S H Gunderson, letter, to R DiSalvo, 2003).

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, CO, June

DOE, 2001, Industrial Area SAP Addendum #IA-02-01 for IHSS Group 700-12, Rocky Flats Environmental Technology Site, Golden, CO, November

DOE, 2003, Draft Data Summary Report for IHSS Group 700-12, PAC 700-1106, Rocky Flats Environmental Technology Site, Golden, CO, September

Gunderson, S H, letter to R DiSalvo, 2003, Final Data Summary Report, May 15

PAC REFERENCE NUMBER: 800-164.2

IHSS Number 800-164 2

Operable Unit Industrial Area (former Operable Unit 14)

IHSS Group 800-4

Unit Name Radioactive Site 800 Area, Site No 2, Building 886 Spills

Approximate Location N748,000, E2,084,000

Date(s) of Operation or Occurrence

1965 - 1989

Description of Operation or Occurrence

(Original HRR [DOE 1992])

Since the occupancy of Building 886 in 1965, the area was a source of concern for possible soil infiltration. A Summary of Events provided in Appendix F of the original HRR (DOE 1992), indicates a contamination release on June 9, 1969. No details are given. On September 26, 1989 a 500-gallon stainless steel portable tank was found leaking a colorless liquid from its drain valve onto the concrete, creating a wet spot approximately 5 inches in diameter. No significant contamination has ever been found.

Physical/Chemical Description of Constituents Released

Building 886 was a facility for Nuclear Safety Research and Development. The soil under and around the building may have been contaminated from uranium spills.

Responses to Operation or Occurrence

A radiation monitoring survey resulted in direct counts of 650 cpm and 12 to 24 dpm on a smear. This was considered low-level contamination. The valves were tightened, decontaminated, bagged, and readied for shipment to Size Reduction Operations in Building 776. The concrete was sealed with acrylic paint. Soil samples indicated contamination from uranium. Contamination was removed from the concrete.

Because of this history and association with Building 886 radiological experimentation, soil sampling was performed for radionuclides, metals, SVOCs, and VOCs in November 2002, in accordance with the IASAP Addendum #IA-02-03 (DOE 2002). Sampling

locations and analytical data are presented in the Final Closeout Report for IHSS Group 800-4 (DOE 2003)

Fate of Constituents Released to Environment

Based upon the characterization sampling results presented in the Final Closeout Report for IHSS Group 800-4 (DOE 2003), there does not appear to be any actual or potential risk to human health or the environment. There were no analytical results above the RFCA ALs (DOE et al 2003)

Action/No Further Accelerated Action Recommendation

Based upon the results of analytical results, no current or potential contaminant source was identified. As shown in the Final Closeout Report (DOE 2003), analytical results from the previous and the most recent sampling events indicated that all PCOCs are less than RFCA WRW ALs and lead was the only contaminant that exceeded the Ecological Receptor AL, as listed in the RFCA Attachment 5 (DOE et al 2003). There are no immediate pathways to surface water or erodable areas at this location.

No long-term stewardship activities are recommended for IHSS 800-164 2 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 800-164 2. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 800-164 2.

DOE received concurrence of NFAA status for IHSS Group 800-4 on May 15, 2003 (S H Gunderson, letter, to R DiSalvo, 2003)

Comments

Building 886 was demolished in 2002

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 2002, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-02-03, Rocky Flats Environmental Technology Site, Golden, Colorado, March

DOE, 2003, Final Closeout Report for IHSS Group 800-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H , letter to R DiSalvo, 2003, Approval of IHSS Group 800-4 Closeout
Report, May 15

PAC REFERENCE NUMBER: 800-164.3

IHSS Number 164 3

Operable Unit Industrial Area (former Operable Unit 14)

IHSS Group 800-6

Unit Name Radioactive Site 800 Area Site #2, Building 889 Storage Pad, including Tank 40

Approximate Location N749,100, E2,083,800

Date(s) of Operation or Occurrence

1966 to the early 2000s

Description of Operation or Occurrence

Building 889 was a decontamination facility that was first occupied in 1969. A storage pad north of the building and an area to the west, were used to store uranium-contaminated equipment and contaminated drums prior to decontamination. A radioactive survey supports the fact that there was contamination at this western location.

Two incidents occurred at Building 889 that involve contaminated drums. On June 16, 1982, uranium chips in a waste drum spontaneously ignited, and on July 20, 1984, a uranium chip fire started in an improperly packed drum. Another incident occurred in September 1983, when nine machine tools were stored outside waiting for decontamination. The plastic sheeting that was covering the equipment had blown off, possibly allowing contamination to spread.

Building 884 was constructed in 1958 as a storage facility for Building 883 and was later used as a mixed waste storage building. In September 1966, drums were reported to be leaking in the drum storage area outside of this building. Approximately 700 square feet (ft²) of soil and rocks were contaminated. It is thought that this information refers to a storage area east of Building 884 that was used prior to the construction of Building 889.

Tank 40 was part of IHSS 000-121 (OPWL) and was located in the 800 Area west of Building 889. Tank 40 was reportedly installed in the mid-1950s and was abandoned in 1981 or 1982. The tank consisted of two 400-gallon underground concrete tanks located in a concrete vault. The top of vault was approximately 7 feet below grade.

Physical/Chemical Description of Constituents Released

As described in IASAP Addendum #IA-02-01 (DOE 2001), PCOCs at IHSS 800-164 3 and Tank 40 were determined based on process knowledge and data collected prior to the accelerated action undertaken during 2002. PCOCs included radionuclides, metals, VOCs, and SVOCs. Characterization results indicate that contaminant concentrations were below the RFCA WRW ALs. Preaccelerated action and accelerated action data are presented in the Final Closeout Report for IHSS Group 800-6 (DOE 2003).

Responses to Operation or Occurrence

Notification of the planned accelerated action was provided in ER RSOP Notification #02-02 (DOE 2002). Activities were conducted between May 8 and July 18, 2002, and involved the removal of process waste lines and Tank 40, site grading and vegetation, and characterization. Surface and subsurface soil samples were collected and analyzed after the removal activities. Details and analytical results are provided in the Final Closeout Report for IHSS Group 800-6 (DOE 2003).

Fate of Constituents Released to the Environment

Results from the accelerated-action characterization (DOE 2003), indicate that soil contaminant concentrations are less than RFCA WRW ALs. Any migration of contaminants would not adversely impact surface water or groundwater quality.

Action/No Further Accelerated Action Recommendation

Based on the actions taken and soil characterization results, there is no contaminant source in the IHSS, and therefore, no actual or potential risk to human health or the environment. No long-term stewardship activities are recommended for IHSS 800-164 3 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 800-164 3. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 800-164 3.

DOE received concurrence of NFAA status for IHSS Group 800-6 on March 25, 2003 (S H Gunderson, letter, to R DiSalvo, 2003).

Comments

None

References

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol (ER RSOP) Notification #02-02, Rocky Flats Environmental Technology Site, Golden, Colorado, February

DOE, 2003, Final Closeout Report for IHSS Group 800-6, Rocky Flats Environmental Technology Site, Golden, Colorado, March

Gunderson, S H , letter to R DiSalvo, 2003, March 25

PAC REFERENCE NUMBER: 800-1205

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	800-2
Unit Name	Building 881, East Dock
Approximate Location	N748,500, E2,084,000

Date(s) of Operation or Occurrence

1953 (date Building 881 occupied) - 1990

Description of Operation or Occurrence

Building 881's east dock may have been an area of potential concern due to the production activities that took place in the building until 1964. The CEARP Phase I Draft indicated that the dock was contaminated in February 1960, but there is no mention of what caused the contamination.

The only documented incident occurred on January 7, 1990. Fire Department personnel found a large puddle on the dock. The Stationary Operating Engineer found the source to be overflow from a condensate pan.

Physical/Chemical Description of Constituents Released

As described in IASAP Addendum #IA-02-04 (DOE 2002), PCOCs at PAC 800-1205 were determined based on process knowledge and data collected prior to the 2002 characterization. PCOCs included radionuclides and metals. Soil was sampled in accordance with IASAP Addendum #IA-02-04 (DOE 2002). Characterization results indicate that all soil contaminant concentrations are less than RFCA ALs, with the following two exceptions:

- The arsenic concentration at sampling location CG34-016 (0 - 2 feet bgs) is 28.1 mg/kg, and the AL is 22.2 mg/kg.
- The barium concentration at sampling location CG34-016 (0 - 2 feet bgs) is 44,500 mg/kg, and the AL is 26,400 mg/kg.

Characterization results are presented in the Final Characterization Data Summary Report for IHSS Group 800-2 (DOE 2003).

Responses to Operation or Occurrence

In accordance with the IASAP (DOE 2001), the 95% upper confidence limit (UCL) of the mean of the COC across the AOC divided by the AL is used to determine if action is warranted. Using this conservative approach across the AOC increases the mean and consequently the ratio between the mean and the AL. If the resulting ratio is less than 1, action is not warranted. In the case of barium, the 95% UCL of the mean across the AOC is 2,841 mg/kg, and the AOC consists of IHSS Group 800-2 (i.e., UBC 881 and PAC 800-1205). The resulting ratio (2,841/26,400) equals 0.108, and therefore, action is not warranted.

In addition, arsenic and barium concentrations are less than three times their ALs. The arsenic concentration is also very close to its AL and is within its background range.

Fate of Constituents Released to the Environment

Results from the accelerated action characterization, based on the Final Closeout Report for IHSS Group 800-2 (DOE 2003), indicate that soil concentrations are less than the RFCA WRW ALs, with the two exceptions noted above. Any migration of contaminants would not adversely impact surface water or groundwater quality. PAC 800-1205 is not located in an area susceptible to landslides or high erosion.

Surface water and groundwater from PAC 800-1205 flow towards the SID and Woman Creek. The distance from the PAC to the SID is more than 500 feet. If COCs (i.e., radionuclides, metals, VOCs and SVOCs at relatively low concentrations) were to migrate to these surface waters, either via erosion or groundwater transport, their concentrations at that point would be very low and probably would not cause an exceedance of water quality standards. During transport, the metals of concern would adsorb onto soil.

Action/No Further Accelerated Action Recommendation

Based on the soil characterization results and the subsurface soil risk screen evaluation, there is no significant contaminant source in the PAC, and therefore, no actual or potential risk to human health or the environment. No long-term stewardship activities are recommended for PAC 800-1205 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of PAC 800-1205. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in PAC 800-1205.

DOE received concurrence of NFAA status for IHSS Group 800-2 on July 16, 2003 (S H Gunderson, letter, to R DiSalvo, 2003)

Comments

None

References

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-02-04, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2003, Final Characterization Data Summary Report for IHSS Group 800-2, Rocky Flats Environmental Technology Site, Golden, Colorado, May

Gunderson, S H , letter, to R DiSalvo, 2003, July 16

PAC REFERENCE NUMBER: 900-140

IHSS Number	140
Operable Unit	Buffer Zone (former Operable Unit 2)
IHSS Group	900-11
Unit Name	Hazardous Disposal Site (IAG Name Reactive Metal Destruction Site)
Approximate Location	N748,500, E2,086,000

Date(s) of Operation or Occurrence

1956 - 1970

Description of Operation or Occurrence

An area in the southeast portion of the 400-acre manufacturing area was used for the destruction and disposal of reactive metals and other chemicals (Figure 2 13) Metallic lithium was destroyed on the ground in the 1950s and 1960s. The activity was described in 1967 as lithium waste being disposed of in a trench, moistened, and then covered with fill at the southeast corner of the site (DOW 1967). After the reaction, the residues were buried (DOW 1974).

The area was fenced to prevent unauthorized personnel from accessing the area. Signs along the fence indicated that the area was a Hazardous Disposal Site (DOW 1968).

Physical/Chemical Description of Constituents Released

Approximately 400 to 500 pounds of lithium were destroyed and the residues, primarily non-toxic lithium carbonate, were buried (DOW 1974). It is believed that nine bottles of nickel carbonyl and one can of iron carbonyl were disposed of in this area in March 1969 (DOW, 1969). The OU2 Phase II RFI/RI report (see below) stated that, in addition to lithium, other elements and compounds that were destroyed at this site included sodium, calcium, magnesium, solvents, and unknown liquids (DOE 1995a).

Responses to Operation or Occurrence

As part of the OU2 Phase II RFI/RI, nine boreholes were drilled to delineate the nature and extent of contamination associated with IHSS 900-140. The samples were analyzed for VOCs, SVOCs, metals, pesticides, PCBs, and radionuclides. The analytical data are summarized in the OU2 Phase II RFI/RI report (DOE 1995a).

IHSS 900-140 is surrounded by IHSS 900-155, the 903 Lip Area. Waste releases at the 903 Pad (IHSS 112) are considered the primary source of radiological contamination in surficial soil adjacent to the 903 Pad (903 Lip Area) and extending east of this location (Americium Zone). The contamination was dispersed from the 903 Pad by the action of wind. Radiological contamination of surficial soil throughout the 903 Lip Area and Americium Zone, including IHSS 900-140, was characterized in 1999, and the results are reported in the Site Characterization Report for the 903 Drum Storage Area, 903 Lip Area, and Americium Zone (Kaiser-Hill, 2002). The data indicate large areas of plutonium and americium contamination in surface soil within the Lip Area and IHSS 900-140 exceed the ALs for protection of a WRW, as presented in RFCA Attachment 5, June 5, 2003. Surficial radiological contamination at 900-140 will be addressed by soil removal pursuant to ER RSOP Notification 03-07. Soil is to be removed to a depth of 6 inches, or to greater depths as necessary, to achieve the plutonium and americium ALs.

Fate of Constituents Released to Environment

Because waste was burned in trenches and buried at 900-140, and some surface soil may not require removal pursuant to Notification 03-07, both surface and subsurface soil data for this IHSS has been evaluated for a NFAA determination.

IHSS 900-140 has been well characterized through previous investigations. Figures 2 14 and 2 15 show the surface and subsurface soil sampling locations. Table 2 16 summarizes the sample analysis program at IHSS 900-140 based on current available data collected during the previous investigations. As can be seen in Table 1, surface soil and subsurface soil samples were analyzed for metals, radionuclides, VOCs, SVOCs, pesticides and PCBs, however, most surface soil samples were analyzed for radionuclides only because this is the analyte of concern in surface soil at this IHSS. All of the analytical suites noted above are well represented for subsurface soil samples.

The surface and subsurface soil data are summarized in Tables 2 17 and 2 18, respectively. These tables show analytes that were detected above background (see discussion below).

Table 2.16
IHSS 140 Analytical Program Summary

Metals	Surface Soil					Subsurface Soil				
	Radionuclides	VOCs	SVOCs	Pesticides	PCBs	Metals	Radionuclides	VOCs	SVOCs	Pesticides
PT029A	90402	SED038	SED038	SED038	SED038	0171	0171	0171	07491	07491
PT029A	BH93098		SS200193	SS200193	SS200193	0271	0271	0271	07591	07591
SED038	BH93198					07491	07491	07491	07691	07691
SS200193	BH93498					07591	07591	07591	09591	09591
	BH97398					07691	07691	07691	09691	09691
	BH97498					09591	09591	09591	09791	09791
	BH97598					09691	09691	09691	13595	
	FOV669					09791	09791	09791	13695	
	PT020					13595	13595	13595	13795	
	PT029					13695	13695	13695	13895	
	SED038					13795	13795	13795		
	SS90401					13895	13895	13895		
	SS90501						90402	21293		
							BH93098	22093		
							BH93198			
							BH93498			
							BH97398			
							BH97498			
							BH97598			

Table 2.17
Surface Soil Contamination Summary

Analyte Group	Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2SD	Wildlife Refuge Worker AL	Ecological Receptor AL	Unit
Metal	Aluminum	3	33.33%	17900.00	17900	16902.00	228000	-	mg/kg
Metal	Barium	4	50.00%	168.00	193	141.26	26400	-	mg/kg
Metal	Chromium	4	50.00%	21.65	26	16.99	268	-	mg/kg
Metal	Iron	4	25.00%	20400.00	20400	18037.00	307000	-	mg/kg
Metal	Lithium	3	66.67%	18.30	22.8	11.55	20400	-	mg/kg
Metal	Manganese	4	25.00%	424.00	424	365.08	3480	-	mg/kg
Metal	Nickel	4	75.00%	17.07	17.6	14.91	20400	-	mg/kg
Metal	Strontium	3	33.33%	52.50	52.5	48.94	613000	-	mg/kg
Metal	Zinc	4	50.00%	83.20	89.3	73.76	307000	-	mg/kg
Radionuclides	Uranium-234	16	6.25%	2.99	2.99	2.25	300	1800	pci/g
Radionuclides	Uranium-235	16	18.75%	0.16	0.28	0.09	8	1900	pci/g
Radionuclides	Uranium-238	16	12.50%	2.92	3.3	2	351	1600	pci/g
VOC	2-Butanone	1	100.00%	19	19	-	192000000	433000	ug/kg
VOC	Acetone	1	100.00%	71	71	-	102000000	211000	ug/kg
VOC	Methylene chloride	1	100.00%	14	14	-	2530000	39500	ug/kg
SVOC	Benzo(a)anthracene	2	50.00%	160	160	-	34900	800000	ug/kg
SVOC	Benzo(a)pyrene	2	50.00%	160	160	-	3490	25700	ug/kg
SVOC	Benzo(b)fluoranthene	2	50.00%	240	240	-	34900	1010000	ug/kg
SVOC	Benzo(k)fluoranthene	2	50.00%	69	69	-	349000	1010000	ug/kg
SVOC	Benzoic Acid	2	50.00%	170	170	-	1000000000	-	ug/kg
SVOC	bis(2-Ethylhexyl)phthalate	2	100.00%	955	1400	-	1970000	-	ug/kg
SVOC	Chrysene	2	50.00%	200	200	-	3490000	-	ug/kg
SVOC	Di-n-butylphthalate	2	100.00%	532.5	1000	-	73700000	-	ug/kg
SVOC	Di-n-octylphthalate	2	50.00%	210	210	-	14700000	-	ug/kg
SVOC	Fluoranthene	2	100.00%	230	390	-	27200000	-	ug/kg

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Analyte Group	Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2SD	Wildlife Refuge Worker AL	Ecological Receptor AL	Unit
SVOC	Pyrene	2	100 00%	218 5	350	-	22100000	-	ug/kg
PCB	Aroclor-1254	2	50 00%	84 00	84	-	12400	371000	ug/kg
Above the WRW or Ecological Receptor AL									

Table 2.18
Subsurface Soil Contamination Summary

Analyte Group	Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus SD	Walloffe or Refuge Worker AL	Ecological Receptor AL	Unit
Metal	Barium	20	5 00%	337 00	337	141 26	26400	-	mg/kg
Metal	Nickel	20	5 00%	1330 00	1330	14 91	20400	-	mg/kg
Metal	Uranium, Total	120	16 67%	6 00	44 55	-	2750	67 8	mg/kg
Radionuclide	Americium-241	40	47 50%	5 89	72 5	0 02	76	1900	pci/g
Radionuclide	Plutonium-239/240	40	57 50%	25 36	139	13 39	30	1800	pci/g
Radionuclide	Uranium-234	40	5 00%	29 00	55	2 25	300	1800	pci/g
Radionuclide	Uranium-235	40	10 00%	0 65	2 1	0 09	8	1900	pci/g
Radionuclide	Uranium-238	40	10 00%	5 29	15	2	351	1600	pci/g
VOC	1,2-Dichloroethene (total)	28	3 57%	2 00	2	-	9200000	-	ug/kg
VOC	Acetone	36	52 78%	73 42	1100	-	102000000	211000	ug/kg
VOC	Carbon Tetrachloride	36	11 11%	14 25	49	-	81500	83200	ug/kg
VOC	Chloroform	36	25 00%	12 22	52	-	19200	101000	ug/kg
VOC	Methylene chloride	36	47 22%	8 94	32	-	2530000	39500	ug/kg
VOC	Tetrachloroethene	36	11 11%	5 25	14	-	615000	37500	ug/kg
VOC	Toluene	36	36 11%	93 23	360	-	31300000	128000	ug/kg
VOC	Trichloroethene	36	22 22%	13 13	44	-	19600	509000	ug/kg
VOC	Xylene	36	5 56%	6	6	-	2040000	-	ug/kg
SVOC	bis(2-Ethylhexyl)phthalate	20	30 00%	194	360	-	1970000	-	ug/kg
SVOC	Butylbenzylphthalate	20	20 00%	63 25	95	-	147000000	-	ug/kg
SVOC	Di-n-butylphthalate	20	5 00%	54	54	-	73700000	-	ug/kg
SVOC	Phenol	20	40 00%	578 75	1100	-	613000000	-	ug/kg
Above the WRW or Ecological Receptor AL									

In these tables, the following decision rules were applied to the calculation of summary statistics

- Data rejected during validation was eliminated from the data set before computing statistics
- The maximum value is the highest detected value observed
- The average was computed using only data that are above background concentrations

Figures 2 16 and 2 17 show, for surface and subsurface soil, respectively, all the data that were detected above background, and that have a RFCA AL (WRW or Ecological Receptor) The ALs are derived from RFCA Attachment 5, dated June 5, 2003 Background levels for inorganic constituents for subsurface soil are from the Background Geochemical Characterization Report (DOE 1993) Background values for surface soils and sediments are from Geochemical Characterization of Background Surface Soils Background Soils Characterization Program (DOE 1995b) All background values used for comparison are the mean background value plus two standard deviations Any detection of an organic compound is considered an above background level observation

Surface Soil Assessment

As shown in Table 2 17 and Figure 2 16, surface soil across much of IHSS 900-140 contains plutonium and americium concentrations greater than the WRW AL (red shaded entries) This contamination is present in the soil from the historical release and wind dispersal of plutonium and americium from the 903 Pad Surface soil (and subsurface soil as necessary) with plutonium and americium concentrations greater than the WRW ALs will be removed pursuant to the 903 Lip Area and Americium Zone Interim Measure/Interim Remedial Action Plan Lead concentrations exceeded the Ecological Receptor AL at PT029A and SS200193, however, in both cases the concentrations were below background for surface soil (Figure 2 16)

Application of the Subsurface Soil Risk Screen

Screen 1 – Are Contaminant of Concern (COC) Concentrations Below Table 3 Wildlife Refuge Worker (WRW) Soil Action Levels?

No As shown in Table 2 18, plutonium was the only analyte detected at concentrations exceeding the WRW AL Figure 2 17 shows that the 0 5 to 1-foot depth samples at boreholes BH97598 and BH93198 exceeded the WRW AL Although below the WRW AL, concentrations in the 1 to 1 5-foot samples at these locations also had plutonium concentrations significantly above background, and in the case of BH93198, in the 1 5 to 2-foot sample It is also noted that samples from the 0 5 to 2-foot interval in boreholes

BH93098 and BH93498 have plutonium concentrations significantly above background, albeit at lower concentrations than is observed at 97589 and BH93198

Screen 2 – Is there potential for subsurface soil to become surface soil?

Yes As shown in RFCA Attachment 5, Figure 1 (DOE et al 2003), IHSS 900-140 is located in an area that was mapped as being prone to landslides

Evaluate accelerated action in accordance with Section 4.C and 5.C and consider any subsequent screens in the evaluation, as appropriate.

As noted in Screen 1 and shown in Figure 2 1 7, the 0 5 to 1-foot depth samples at boreholes 97589 and BH93198 exceed the WRW AL However, this contaminated soil will be removed pursuant to the 903 Lip Area and Americium Zone IM/IRA Plan

Screen 3 – Does subsurface soil radiological contamination exceed criteria in Section 5.3 and Attachment 14?

No ALF Section 5 3(C)(2) requires the removal of soil in the 3-6 foot depth interval that contains plutonium at concentrations that exceed 3 nCi/g with an areal extent of contamination that exceeds 80m² As shown in Figure 5, the highest plutonium concentrations are in the 0 5 to 1-foot depth samples at boreholes 97589 and BH93198, and these concentrations are significantly lower than 3 nCi/g

Screen 4 – Is there an environmental pathway and sufficient quantity of COC that would cause exceedance of surface water standards (SWS)?

No Contaminant migration via erosion and groundwater are the two possible pathways whereby surface water could become contaminated by the East Trenches Although erosion may be a significant pathway to transport plutonium to Woman Creek surface water, the plutonium contamination in surface soil at IHSS 900-140 will be addressed by the 903 Lip Area and Americium Zone IM/IRA

With respect to the groundwater pathway, shallow groundwater is present at IHSS 900-140, and the groundwater flow is to the southeast There is considerable chlorinated solvent contamination in the groundwater, some or most of which appears to have originated from the 903 Pad and Trench T-2 (Figure 2 18) (DOE 2002) Because chlorinated solvents are only at trace concentrations in the subsurface soil at IHSS 900-140, it does not appear the IHSS is a source for groundwater contamination Regardless, groundwater contamination in this area will be addressed by the Groundwater Plumes IM/IRA

Screen 5 – Are COC concentrations above Table 3 Action Levels for ecological receptors?

Yes The 8.2 – 12-foot sample from borehole 07491 had a lead concentration of 25.8 mg/kg (Figure 5). The Ecological Receptor AL for lead is 25.6 mg/kg. This is the only subsurface sample with an analyte concentration that exceeded an Ecological Receptor AL, and the concentration is virtually indistinguishable from the AL or the background concentration (24.97 mg/kg). Also, the lead AL of 25.6 mg/kg is based on protection of the American Kestrel. Because the American Kestrel, a bird of prey, would not be directly exposed to the subsurface soil, PRGs for other ecological receptors were examined⁴. The PRGs for protection of the prairie dog and PMJM are 149 mg/kg and 642 mg/kg, respectively. Because the low concentration of lead relative to these PRGs, it is concluded for this NFAA determination that there is no threat posed to ecological receptors by the IHSS 900-140⁵. The sample is also from a depth that a prairie dog or PMJM is unlikely to burrow.

Stewardship Evaluation

Application of the SSRS to IHSS 900-140 indicates NFAA is necessary for protection of public health and environment. This conclusion is drawn in light of plutonium contaminated surface soil and shallow subsurface soil being addressed by the 903 Lip Area and Americium Zone action. The IHSS does not appear to be a source for the groundwater contamination in the area, and the existing contamination will be addressed by the Groundwater Plumes IM/IRA. Also, because only one subsurface soil sample had a lead concentration that exceeded the Ecological Receptor soil AL, and the concentration was near background and the AL, and below PRGs for burrowing animals, near-term and long-term stewardship actions are not necessary.

IHSS 900-140 will be evaluated as part of the Sitewide CRA, which is part of the RFI/RI and CMS/FS that will be conducted for the Site. The need for and extent of long-term stewardship activities will be reanalyzed in RFI/RI and CMS/FS and will be proposed, as appropriate, as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in the CAD/ROD, in any post-closure CHWA permit that may be required, and in any post-RFCA agreement.

⁴ The AL is the lowest PRG above Site background levels that was calculated for each of the five selected wildlife receptors judged to be representative of species at RFETS: PMJM and black-tailed prairie dog (fossorial [burrowing] small mammals), mourning dove (small ground-feeding bird), terrestrial invertebrate (multiple species), and American kestrel (avian predator).

⁵ At this time, ecological receptor ALs are not available for all receptors/chemical combinations, however, draft ALs are available for a small subset of chemicals. Screen 5 currently evaluates only this subset. Risk to ecological receptors will be readdressed through the ecological risk assessment portion of the CRA.

NFAA Summary

IHSS 900-140 is proposed for NFAA. The Subsurface Soil Risk Screen and ALs in RFCA Attachment 5 dated 6/5/03 have been applied to the characterization data for this IHSS. The risk screen shows no potential adverse risk to a wildlife refuge worker or ecological receptor. Plutonium is present in the surface soil and shallow subsurface soil at concentrations that exceed the WRW AL. However, this contaminated soil will be addressed by the 903 Lip Area and Americium Zone action. The IHSS does not appear to be a source for the groundwater contamination in the area, and the existing contamination will be addressed by the Groundwater IM/IRA. Lastly, only one subsurface soil sample had an analyte concentration (lead) that exceeded the Ecological Receptor soil AL, and the concentration was near background and the AL, and below PRGs for burrowing animals. Therefore, it is concluded through application of the Subsurface Soil Risk Screen that NFAA is required at IHSS 900-140.

References

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PAC REFERENCE NUMBER: 900-153

IHSS Number 153 Operable Unit 2

Operable Unit Buffer Zone (former Operable Unit 2)

IHSS Group 900-2

Unit Name Oil Burn Pit No 2

Approximate Location N749,500, E2,086,000

Date(s) of Operation or Occurrence

March 1957 - May 1965

Description of Operation or Occurrence

(1999 Annual HRR Update [DOE 1999])

Drums containing oil contaminated with uranium were burned in an open pit located north of Central Avenue and southeast of Building 991. These activities took place adjacent to the Mound (PAC 900-113). The oil burn pit was actually two trenches excavated parallel to each other. The oil in the drums was dumped into the pit and ignited. Oil was burned at night so smoke would not cause alarm. On the order of 80 drums of oil were burned in a typical month. The originating buildings reused the drums until they were flattened and buried in trenches onsite (PAC NE-110 and PAC NE-111). An October 1960 study stated that organic liquids were stored due to the lack of proper facilities to burn the wastes. In February 1961, a study performed by the Health Physics group assured the operators that open pit burning was safe. A second oil-burning pit was cut in November 1961 and may be a reference to the parallel trench.

Physical/Chemical Description of Constituents Released

(1999 Annual HRR Update [DOE 1999])

The materials contained in the drums were coolant, still bottoms, and waste oils from Building 444 and Building 881. Attempts were made to burn only nonradioactively contaminated oils. During a burning test in February 1961, a direct count value monitored from the test was three times as high as the value from the Building 881 stack on that day. This was considered acceptable because the burning occurred over a short period and would not materially add to the airborne activity released to the atmosphere.

Groundwater and incidental storm event water routinely entered the burn pit and became contaminated. Laboratory experiments resulted in reducing the oil/water activity from 300,000

dpm/L to 12,000 dpm/L uranium activity. Additional experimentation involving the extraction of oil from water in the "old" oil-burning pit is documented, however, results from these studies could not be found.

Responses to Operation or Occurrence

The oil burn residue and some flattened drums remaining in the oil burn pit were covered with fill. Signs were posted in the area of the oil burn pit in May 1959 to warn of contamination. Air monitoring by Health Physics was routinely performed. High-volume air samples were taken during burning of oil on several occasions.

Oil burning was halted in June 1965 to be replaced by a more efficient method of disposal. Approximately 240 boxes of soil were excavated in 1978 from Oil Burn Pit No. 2 and shipped off site for disposal to remove the contaminated residues. Cleanup criteria were based on radioactivity in the area and not solvent residue. Approximately 10,000 cubic feet of depleted uranium residue were estimated to be present in the area prior to the excavation.

IHSS 153 was selected for further study and possible characterization sampling during the planning and research stages of the 1999 Potential No Further Action Characterization Program. As referenced above, approximately 240 wooden boxes of contaminated soil were removed from Oil Burn Pit No. 2 in 1978 during the installation of the Protected Area (PA) security fence. Confirmatory sampling using a geoprobe was planned in January 1999 to obtain environmental characterization data from within the IHSS, however, this activity was disallowed for security reasons because the investigation area underlies the PA security fence. Characterization of IHSS 153 was dependent on the D&D of the security fence.

Based on historical information regarding IHSS 900-153, previous sampling data, soil was sampled at 33 locations in with the BZ SAP Addendum #BZ-02-01 (DOE 2002), the following PCOCs were targeted, metals, radionuclides, SVOCs, VOCs, PCBs, and pesticides.

Fate of Constituents Released to Environment

(1999 Annual HRR Update [DOE 1999])

A controlled burning experiment was performed in an open pit north of Building 331 (PAC 300-128) prior to the initiation of burning in Oil Burn Pit No. 2. The results of this experiment, which focused on air emissions, were favorable in considering burning of uranium-contaminated oil in open pits as a disposal practice. Decisions regarding the handling of the contaminated residue left after the burns are unknown.

It is unknown whether the removal of approximately 240 waste crates in 1978 sufficiently removed the source of contamination from the Oil Burn Pit No. 2. Further, it cannot be certain whether the monitoring equipment used to ascertain levels of contamination during the removal operation were sufficient.

Action/No Further Accelerated Action Recommendation

Analytical results from the most recent sampling event at IHSS 900-153 indicate that tetrachloroethene in two locations and trichloroethene in one location, both from 2.5 feet to 10.5 feet bgs were found at concentrations greater than RFCA ALs. All other contaminant concentrations in this IHSS are below RFCA ALs (DOE 2003). However, NFAA is warranted based on the SSRS (RFCA Attachment 5) (DOE et al 2003). In addition, analytical results from previous characterization sampling are below WRW ALs (DOE et al 2003).

No long-term stewardship activities are recommended for IHSS 900-153 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 900-153. No specific engineered controls are anticipated as a result of the conditions remaining in IHSS 900-153. Current groundwater monitoring will be continued.

DOE proposed that NFAA is necessary for Group 900-2 on August 6, 2003 (J A Legare, letter, to S H Gunderson, 2003). The NFAA is pending regulatory agency approval.

Comments

(1999 Annual HRR Update [DOE 1999])

In many documents, the total number of drums burned in the pit is listed as 1,082. This number appears to have omissions (for example from the period of January 1961 through June 1961 during which time 228 drums were burned). The retired RFP employees interviewed confirmed that oil-burning activities were not halted between 1957 and 1961. Moreover, there are two references to oil actively being burned near Building 991 in 1959 and again in 1960. None of the drums of oil burned between June 1957 and June 1961 was included in the derivation of 1,082 drums being burned. At least 272 drums of oil were burned in addition to the 1,082 mentioned in many of the documents.

Additional research of historical photographs was conducted in February 1999, and confirmed that the majority of IHSS 153 is under the PA security fence.

References

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Plant, Golden, Colorado, September

DOE, 2002, Buffer Zone Sampling and Analysis Plan Addendum #BZ-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, March

DOE, 2003, Data Summary Report for IHSS Group 900-2, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June 19

Legare, J A , letter, to S Gunderson, 2003, Transmittal of the Final Data Summary Report for IHSS Group 900-2, August 6

PAC REFERENCE NUMBER: 900-154

IHSS Number 154

Operable Unit Buffer Zone (former Operable Unit 2)

IHSS Group 900-2

Unit Name Pallet Burn Site

Approximate Location N749,500, E2,085,500

Date(s) of Operation or Occurrence

1965

Description of Operation or Occurrence

(1999 Annual HRR Update [DOE 1999])

According to persons interviewed for the CEARP Phase I, wooden pallets were burned in an area southwest of Oil Burn Pit No 2 (PAC 900-153) No documentation was found that provided detail for this event

Physical/Chemical Description of Constituents Released

(1999 Annual HRR Update [DOE 1999])

No documentation was found that detailed the constituents released to the environment

Responses to Operation or Occurrence

The site was "removed" in the 1970s according to one reference

IHSS 154 was selected for further study and possible characterization sampling during the planning and research stages of the 1999 Potential No Further Action Characterization Program The above reference states that the site was removed in the 1970s suggesting that the potential source (if any) was also removed Confirmatory sampling using a geoprobe was planned in January 1999 to obtain environmental characterization data from within the IHSS However, this activity was disallowed for security reasons because the investigation area underlies the PA security fence Characterization of IHSS 154 was dependent on the D&D of the security fence

Based on historical information regarding IHSS 900-154 and previous sampling data, soil samples were collected from 33 locations performed in accordance with BZSAP Addendum

#BZ-02-01 (DOE 2002) The following PCOCs were targeted metals, radionuclides, SVOCs, PCBs, and pesticides

Fate of Constituents Released to Environment

(1999 Annual HRR Update [DOE 1999])

The site was identified as being located in the PA The area would have been disturbed when the PSZ was constructed in 1980

Retired RFP employees interviewed for this report, who were cognizant of the oil burning activities, did not know of any pallets burned in the area specified in CEARP Phase 1 Long-term employees with the RFP Fire Department indicated that the department does not have records of pallets being burned north of Central Avenue as located in CEARP

Action/No Further Accelerated Action Recommendation

Analytical results from the most recent sampling event at IHSS 900-154 indicate that arsenic is above RFCA ALs in two locations from 4 5 feet to 6 5 feet bgs All other contaminant concentrations in this IHSS are less than RFCA ALs (DOE 2003) However, NFAA is warranted based on the Subsurface Soil Risk Screen (RFCA Attachment 5) (DOE et al 2003) In addition, analytical results from previous characterization sampling are less than RFCA ALs (DOE et al 2003)

No long-term stewardship activities are recommended for IHSS 900-154 beyond the generally applicable Site requirements that may be imposed on this area in the future Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 900-154 No specific engineered controls are anticipated as a result of the conditions remaining in IHSS 900-154 Current groundwater monitoring will continue

DOE proposed that NFAA is necessary for Group 900-2 on August 6, 2003 (J A Legare, letter, to S H Gunderson, 2003 The NFAA is pending regulatory agency approval

Comments

None

References

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Plant, Golden, Colorado, September

DOE, 2002, Buffer Zone Sampling and Analysis Plan Addendum #BZ-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, March

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2003, Data Summary Report for IHSS Group 900-2, Rocky Flats Environmental Technology Site, Golden, Colorado, July 19

Legare, J A , letter, to S Gunderson, 2003, Transmittal of the Final Data Summary Report for IHSS Group 900-2, August 6

PAC REFERENCE NUMBER: 900-165

IHSS Number 900-165

Operable Unit Industrial Area (Former Operable Unit 6)

IHSS Group 000-1

Unit Name Triangle Area

Approximate Location N751,000, E2,086,000

Date(s) of Operation or Occurrence

1966 - 1975

Description of Operation or Occurrence

(Original HRR [DOE 1992])

The Triangle Area (IHSS 900-165) is located east of and partially overlaps the Swinerton and Walberg (S&W) contractors storage yard (IHSS 900-176). Both IHSSs are located east of the SEP (IHSS 000-101) and are bounded by Spruce Avenue and the Northeast Perimeter Road. The area is referred to by many different names including Solar Pond Storage Yard, PU&D Pond Storage Yard, and 779 Storage Yard. Several incidents of leaking storage drums were noted and are described below.

Drums were first moved into the Triangle Area during the construction of a drum storage area north of Building 883. The contents of the drums stored in the area were recoverable plutonium-bearing wastes and residues. Scrap material awaiting plutonium recovery was also stored in the Triangle Area. Examples of the types of scrap stored are graphite molds, crucibles, combustible wastes awaiting incineration, incinerator ash heels, crucible heels, and Raschig rings. No sludges or oils were stored in the Triangle Area. Some drums contained dilute HNO_3 , which contributed to the corrosion of the drums.

Drums with dilute HNO_3 were stored directly on the ground for the winter of 1966/1967. The following spring, the drums were placed on wooden pallets. The drums were to have been double-lined with polyethylene bags with rigid poly drum liners in use after 1970. Drums were stored on wooden pallets until 1971 when they were stored in cargo containers. In 1973, an effort was initiated to transfer all plutonium scrap to indoor storage.

In 1968, more than 6,000 drums were stored in the open field. High winds in the unprotected area blew over as many as 150 drums at a time. Drums containing fire waste from the May 1969

fire were stored in the triangle area until they could be counted at Building 771. Some fire waste was returned to the triangle area for storage after being counted.

Radioactively contaminated salts from the SEP were often blown across the S&W Contractor Storage Yard and Triangle Area and onto the drums. The integrity of the drums was damaged by collected condensation and from being blown over by the wind. In 1969, approximately 292 leaking drums were discovered. About 200 square feet of soil received high-level contamination.

In the summer of 1973, two drums containing incinerator ash heels leaked through the floor of the cargo container in which they were stored. In June 1973, 200 yards of plutonium-contaminated soil was temporarily stored on the eastern side of the triangle area. The soil came from the excavation of waste storage tanks near Building 774 (IHSS 700-146).

Physical/Chemical Description of Constituents Released

(Original HRR [DOE 1992])

The contents of the drums stored in the area were recoverable plutonium-bearing wastes and residues. Scrap material awaiting plutonium recovery was also stored in the Triangle Area. Examples of the types of scrap stored are graphite molds, crucibles, combustible wastes awaiting incineration, incinerator ash heels, crucible heels, and raschig rings. No sludges or oils were stored in the Triangle Area. Some drums contained dilute nitric acid, which contributed to the corrosion of drums.

Responses to Operation or Occurrence

In 1969, leaks and spills were detected. They were monitored and decontaminated according to the criteria used for spills in indoor processing areas. The leaking drums prompted the containment of the drums in cargo containers in 1973. In 1973, some of the cargo containers were noted to be leaking the contents of some drums. Recovered radioactive soil was shipped off site.

Subsequent to the 1973 leaking of drums through several cargo container floors, all cargo containers were fiberglassed on the inside floors for added containment. Alpha surveys were performed when drums or cargo boxes were moved out of the area. The surveys were limited to the area where the drum or box had been. Alpha and gamma surveys of the entire area took place in August 1974. The first field instrument for the detection of low-energy radiation (FIDLER) survey is believed to have taken place in September 1974, with surveys ending in mid-1975. A survey performed in April 1975 indicated no new hot spots and no contaminated soils were removed during that time. Surveys were performed periodically after 1975 and areas of soil were removed, as appropriate.

Based on historical information regarding the drum storage and associated soil staining, soil samples were collected and analyzed for radionuclides, metals, SVOCs, and PCBs in November 2002, in accordance with IASAP Addendum #IA-03-02 (DOE 2002). Surface soil samples were

collected from 14 locations within IHSS 165 and these locations and analytical data are summarized in the Group 000-1 Data Summary Report (DOE 2003a)

Fate of Constituents Released to Environment

Based on the characterization sampling results presented in the Closeout Report for IHSS Group 000-1, Solar Evaporation Ponds Area of Concern (DOE 2003b), and the Data Summary Report for IHSS Group 000-1 (DOE 2003a), there does not appear to be any actual or potential risk to human health or the environment. There were no analytical results greater than RFCA ALs (DOE et al 2003)

Action/No Further Accelerated Action Recommendation

Based on the analytical results from the soil samples, no current or potential contaminant source was identified. PCOCs for this site were not detected above the RFCA ALs (DOE et al 2003a, DOE et al 2003)

No long-term stewardship activities are recommended for IHSS 000-165 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 000-165.

No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 000-165.

DOE received concurrence of NFAA status for IHSS Group 000-1, PAC 900-165 on July 29, 2003 (S H Gunderson, T Rehder letter, to J Legare, 2003)

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 2002, Industrial Area Sampling and Analysis Plan Fiscal Year 2002, Addendum #IA-03-02, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2003a, Data Summary Report for IHSS Group 000-1, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2003b, Closeout Report for IHSS Group 000-1, Solar Evaporation Ponds Area of Concern, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DQE, CDPHE and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H , T Rehder letter, to J Legare, 2003, Approval of Data Summary Report, IHSS Group 000-1, July 29

PAC REFERENCE NUMBER: 900-175

IHSS Number 175

Operable Unit Industrial Area (former Operable Unit 10)

IHSS Group 900-4&5

Unit Name S&W Building 980 Contractor Storage Facility

Approximate Location N750,000, E2,085,000

Date(s) of Operation or Occurrence

1980 - 2002

Description of Operation or Occurrence

(Original HRR [DOE 1992])

The S&W contractor storage facility is located south of Building 980. The area was used for the storage of 55-gallon drums in a 25-foot by 25-foot area. These drums were placed directly on the ground. A 1 to 1.5-foot-high berm was situated on the western, southern, and eastern sides of the yard in which the storage facility was located. No documentation was found identifying leaks or spills, although soil staining was noted in a March 1988 visual survey. However, clean gravel was brought in and the area regraded since the March 1988 inspection. The area is currently vacant.

Physical/Chemical Description of Constituents Released

The wastes stored in the drums were generated in the on-site contractors' maintenance and fabrication shops and typically came from vehicle maintenance and miscellaneous painting activities. Generally, the drums contained waste oils and thinners. No documentation was found that detailed constituents released to the environment.

Responses to Operation or Occurrence

The 55-gallon drums were removed, clean gravel was brought in, and the area was regraded some time after March 1988.

Based on historical information regarding the drum storage and associated soil staining, soil sampling and analysis at six surface locations was performed in April 2002 for metals,

inorganics, SVOCs and radionuclides in April 2002 in accordance with the IASAP Addendum #IA-02-02 (DOE 2002)

Fate of Constituents Released to Environment

No documentation could be found pertaining to soil removal or cleanup activities for the soil staining

Action/No Further Accelerated Action Recommendation

Based upon the results of the soil samples collected, no current or potential contaminant source was identified. As described in the IHSS Group 900-4&5 Data Summary Report (DOE 2003), analytical results from the previous and the most recent sampling events indicate that all PCOCs are less than RFCA WRW ALs (DOE et al 2003). Lead is the only contaminant that exceeds RFCA ecological receptor ALs, however, all of these results are below background level.

No long-term stewardship activities are recommended for IHSS 900-175 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 900-175. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 300-175.

PAC 900-175 received concurrence that NFAA was required on July 23, 2003.

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 2002, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-02-02, Rocky Flats Environmental Technology Site, Golden, Colorado, January

DOE, 2003, Data Summary Report for IHSS Group 900-4&5, Rocky Flats Environmental Technology Site, Golden, Colorado, July

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H, letter to J Legare, 2003, July 23

PAC REFERENCE NUMBER: 900-176

IHSS Number 900-176, IHSS Group 000-1

Operable Unit Industrial Area (Former Operable Unit 10)

IHSS Group 000-1

Unit Name S&W Contractor Storage Yard

Approximate Location N750,500, E2,085,500

Date(s) of Operation or Occurrence

1960 - 2002

Description of Operation or Occurrence

(Original HRR [DOE 1992])

The S&W contractor storage yard was located east of the 207B-Center and 207B-South SEP (IHSS 000-101) and west of the Triangle Area (PAC 900-165) The Contractor Storage Yard is considered a potential AOC because of two significant considerations One is the wind-blown radioactive nitrate spray from the adjacent solar ponds The other is the hazardous nature of some of the contractor material stored in the yard

This area received spray from the pond surfaces during high winds Construction of the 207B series of SEP was completed in June 1960 The adjacent area east of these ponds became a contractor storage yard sometime after 1966 but before 1969 and most of the structures and equipment stored in the yard were affected by spray from the ponds High winds have blown low-level (102 dpm per 100 cm²) contamination and salts out of the solar ponds onto equipment that was stored in the S&W area No significant alpha contamination has been found

The primary use of the yard was the storage of surplus or raw materials Drums containing construction material, which qualified as hazardous waste, were stored in the area until 1985 Drums were placed directly on the ground or on wooden pallets Building 964 was also located in the area until late 2002 and was used for the storage of hazardous waste There are no documented releases to the environment from waste storage practices from Building 964

There has been visual evidence of spills or leakage in the storage yard In August 1988, a fuel oil spill of unknown quantity occurred in the yard as a result of a leaking portable heating unit The quantity of fuel oil spilled was not reportable

Physical/Chemical Description of Constituents Released

(Original HRR [DOE 1992])

The water in the solar ponds has historically contained elevated concentrations of nitrate and low-level concentrations of radioactivity, as well as VOCs and inorganic components

In general, the drums stored in the storage yard contained waste oils with some VOCs, and metals. No other documentation was found that detailed the description of constituents released to the environment from the storage activities

Responses to Operation or Occurrence

Alpha surveys were performed periodically to evaluate conditions surrounding the SEP due to wind-blown spray

In response to the August 1988 fuel oil spill, the oil-soaked soil was excavated and transported to the Present Landfill (PAC NW-114). All drums containing hazardous waste or constituents were removed by March 1988. After 1988, the area was primarily used to store equipment

Because of this area's history and proximity to and overlapping IHSSs, soil was sampled for radionuclides, metals, SVOCs, and PCBs in November 2002, in accordance with the IASAP Addendum #IA-03-02 (DOE 2002). Sampling locations and analytical data are presented in the Group 000-1 Data Summary Report (DOE 2003a)

Fate of Constituents Released to Environment

Historically, radiological activities in surface soil were observed to be low level (102 dpm per 100 cm²) from winds blowing across the SEP

Based upon the characterization sampling results presented in the Closeout Report for IHSS Group 000-1, Solar Evaporation Ponds Area of Concern, (DOE 2003b) and the Data Summary Report for IHSS Group 000-1 (DOE 2003a), there does not appear to be any actual or potential risk to human health or the environment. There were no analytical results greater than the RFCA ALs.

Action/No Further Accelerated Action Recommendation

Based upon the results of the soil samples collected, no current or potential contaminant source was identified. PCOCs for IHSS 900-176 were not detected above the RFCA ALs (DOE et al 2003a, DOE et al 2003)

No long-term stewardship activities are recommended for IHSS 900-176 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater

pumping in the area of IHSS 900-176 No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in IHSS 300-128

DOE received concurrence of NFAA status for IHSS Group 000-1, PAC 900-176 on July 29, 2003 (S H Gunderson, T Rehder letter, to J Legare, 2003)

Comments

IHSS 900-176 partially overlaps IHSS 900-165

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, June

DOE, 2002, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-03-02, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2003a, Data Summary Report for IHSS Group 000-1, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2003b, Closeout Report for IHSS Group 000-1, Solar Evaporation Ponds Area of Concern, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H , T Rehder letter, to J Legare, 2003, Approval of Data Summary Report, IHSS Group 000-1, July 29

PAC REFERENCE NUMBER: 900-1310

IHSS Number	NA
Operable Unit	Industrial Area
IHSS Group	000-1
Unit Name	Interceptor Trench system (ITS) Water Spill
Approximate Location	N751,000, E2,085,000

Date(s) of Operation or Occurrence

November 30, 1992

Description of Operation or Occurrence

A release of approximately 490 gallons of interceptor trench water was reported at 1 45 AM on November 30, 1992. Surface water runoff and potentially contaminated groundwater are collected in the ITPH system prior to being pumped from a centralized sump into the 207B North Solar Evaporation Pond. The release originated from a separation of a pipe coupling in the 3-inch transfer line on the east slope of the 207B North solar Evaporation Pond berm and flowed onto the surrounding soil.

The 3-foot section of drain hose that was connected to the end of the inlet pipe to the 207B North Pond had frozen during several days of sub-zero weather and caused a back pressure in the pipe when the interceptor central sump began to pump water into the pond.

Description of Operation or Occurrence

(See HRR Quarterly Update No. 2 [DOE 1993] for complete write-up)

The interceptor trench water is managed as RCRA-regulated hazardous waste because the groundwater may have contained RCRA-regulated hazardous constituents due to the possibility of releases from the SEP. Previous analytical testing indicated that the listed hazardous waste constituents have been detected in the interceptor trench water. The material in the SEP was characterized as RCRA-regulated waste with the following EPA waste codes: D006, F001, F002, F003, F005, F006, F007, and F009. A sample of the water was taken on November 30, 1992 and preliminary results indicated that CLP volatiles were comparable to analytical results taken previously for this waste stream. Upon validation of analytical results, all data was forwarded to the CDPHE.

Responses to Operation or Occurrence

CDH was notified on November 30, 1002 that the RCRA Contingency Plan had been implemented The EPA, Region 8 was notified by facsimile on December 1, 1002

The pipe connection was repaired and the system was placed back into service The released material was not directly recoverable because it soaked into the soil Because of the location of the release (upgradient of the ITPH system in an area previously identified to be possibly contaminated by past releases from the proximal SEP), no action was taken to immediately recover the material

PAC 900-1310 was included in the SEP AOC (DOE 2003a) Five soil samples were collected from PAC 900-1310 in accordance with IASAP Addendum #IA-02-07 (DOE 2002)

Fate of Constituents Released to Environment

The area impacted by this release was submitted in accordance with the IAG, Sections I B 3 Notification, and I B 5 Historical Release Report for final disposition

Characterization results, described in the Closeout Report for IHSS Group 000-1 Solar Evaporation Ponds Area of Concern (DOE 2003b), indicated that all PCOC concentrations were less than WRW and ecological receptor ALs

Action/No Further Accelerated Action Recommendation

Based on the results of the soil samples collected, no current or potential contaminant source was identified PCOCs for PAC 900-1310 were not detected at concentrations greater than RFCA WRW and ecological receptor ALs (DOE 2003b)

No long-term stewardship activities are recommended for IHSS Group 000-1 AOC beyond the generally applicable Site requirements that may be imposed on this area in the future Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of IHSS 000-1 AOC

No specific engineered controls are anticipated as a result of the conditions remaining in IHSS Group 000-1 Current groundwater monitoring will continue

DOE received concurrence of NFAA status for Group 000-1 AOC on July 25, 2003 (S H Gunderson letter to J Legare, 2003a) and approval of the PAM in May, 2003 (S H Gunderson letter to J Legare, 2003b)

Comments

Map generation of spill area and survey coordinates are in progress Addition of current validated analytical results will be transmitted to the EPA and CDH upon receipt to accompany this update

References

DOE, 1993, Second Quarterly Update to the Historical Release Report, Rocky Flats Plant, Golden, Colorado, July

DOE, 2002a, Industrial Area Sampling and Analysis Plan Fiscal Year 2002, Addendum #IA-02-07, Rocky Flats Environmental Technology Site, Golden, Colorado, August

DOE, 2003a, Proposed Action Memorandum for IHSS 101 and RCRA Closure of the RFETS Solar Evaporation Ponds, Rocky Flats Environmental Technology Site, Golden, Colorado, December

DOE, 2003b, Closeout Report for IHSS Group 000-1 Solar Evaporation Ponds Area of Concern, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, CDPHE, and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H , T Rehder letter to J Legare, 2003a, July 25

Gunderson, S H , letter to J Legare, 2003b, Solar Evaporation Ponds PAM, May

RCRA Contingency Plan Implementation Report No 89-015

RCRA Contingency Plan Implementation Report No 90-002

RCRA Contingency Plan Implementation Report No 90-003

PAC REFERENCE NUMBER: UBC SITE 123

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	100-4
Unit Name	Building 123 Under Building Contamination
Location	N749,000, E2,082,000 (Building 123)

Date(s) of Operation or Occurrence

No documentation was found that detailed the dates of occurrence. Building 123 was first occupied in 1953. However, it is believed that leaks of process waste could have occurred from the start of operations up to approximately 1975.

Description of Operation or Occurrence

Building 123 was located on Central Avenue, between Third and Fourth Streets. The original building was constructed in 1953, with additions completed in 1968, 1972, and 1974. Building 123 housed the Site's Radiological Health Physics Laboratory, where water, biological materials, soil, air, and filter samples were analyzed for the presence of plutonium, americium, uranium, alpha, beta, and gamma radiation, tritium, beryllium, and organic constituents. In addition, personnel radiation badges were counted and repaired in Building 123. Radioactive sources, including cesium, were stored in belowgrade concrete pits. Low-level liquid and chemical wastes were generated and transferred to onsite treatment systems via the process waste transfer and collection system (DOE 1992). Portions of RCRA Unit 40, including sumps and pipes, were part of UBC Site 123. Some of the underground process waste lines associated with Building 123 were abandoned in place and plugged with cement in 1982 (OPWL), while others remained in active use until laboratory operations were suspended in preparation for facility decommissioning (NPWL).

Building 123 was decommissioned in 1998 in accordance with the PAM for the decommissioning of Building 123 (RMRS 1998a). At that time, the building structure, along with the aboveground portions of the process waste system, was removed and the floor slab was sampled to assess areas of potential contamination. Contaminated portions of the slab that could not be decontaminated to meet the applicable unrestricted release criteria were encapsulated with epoxy paint to fix removable contamination and covered with steel plate.

In addition, the underground sumps, pipe chases, and process waste lines that ran from Room 156, through Rooms 157 and 158, to Valve Vault 18, were clean-closed in place in accordance

with the Closure Plan for the Building 123 Components of RCRA Unit 40 (NPWL PAC 000-504) (RMRS 1997) Partial closure was certified by a Colorado-registered professional engineer on May 28, 1998 (RMRS 1998b) A contaminated sump, located in Room 125, was removed during decommissioning Final disposition of the building slab, underground sumps, process waste lines (including the abandoned lines), and source pits were deferred to the ER Program

Physical/Chemical Description of Constituents Released

Building 123, the Health Physics Laboratory, generated low-level radioactive waste as well as chemical wastes The types of waste consisted of laboratory wastes from analysis of urine, fecal, and other bioassay samples Process wastes reportedly leaked from the OPWL, including nitrate-bearing wastes that may have contained radionuclides Unconfirmed reports of contaminant spills also were indicated in interviews with building employees In the late 1960s or early 1970s, a cesium-contaminated liquid was reportedly spilled on the concrete floor in Room 109 The floor was immediately sealed to immobilize the contamination Room 109 also contained source storage pits Undocumented thorium research was performed in Room 105 Scoping surveys conducted in May through July 1997 revealed elevated levels of radioactivity in both Rooms 105 and 109 In-situ gamma spectroscopic measurements performed in August 1997 indicated the presence of cesium-137 and thallium-232 in Rooms 109 and 105, respectively (RMRS 1998c) PCOCs beneath the slab are uranium, plutonium, cesium, metals, VOCs (DOE 2000a)

As described in IASAP Addendum #IA-02-01 (DOE 2001b), PCOCs at UBC 123 were determined based on data collected during the characterization of UBC 123, as summarized in the Final Data Summary Report for the Characterization of UBCs 123 and 886 (DOE 2001b), and data collected during previous studies (DOE 2001c, DOE 2000b) These pre-accelerated action data, greater than background plus two standard deviations or MDLs, along with RFCA Tier I and Tier II ALs are described in the IASAP Addendum #IA-02-01 Because a sufficient number of samples were collected during previous studies to characterize UBC Site 123, additional characterization was not required Results from previous sampling and analysis of surface and subsurface soil at UBC 123 and IHSS 148 indicated that

- Lead was detected in subsurface soils above the Tier I AL at one location,
- Radionuclides and metals were detected at concentrations above background plus two standard deviations at UBC 123 and IHSS 148,
- An arsenic concentration exceeding the Tier II AL but below background was detected at one location in surface soil,
- A beryllium concentration exceeding the Tier II AL was detected at one location in surface soil, and
- Methylene chloride was detected in subsurface soil at levels slightly above the RFCA Tier II AL

Responses to Operation or Occurrence

The accelerated action included removal of the Building 123 slab, footers, source pits, manholes, sumps, process waste lines, and contaminated soil, as well as site reclamation. Activities were conducted between January 29 and April 18, 2002. Details are provided in the Closeout Report for IHSS Groups 100-4 and 100-5 (DOE 2003).

Confirmation sampling and analysis were conducted, after excavation and before backfilling, to verify accelerated action goals. Confirmation sampling results indicate that all contaminant concentrations are less than RFCA Tier II and WRW ALs (DOE 2003).

RCRA Unit Closure

The pipe chases and sumps in Rooms 156, 157, and 158 were closed in accordance with the Closure Plan for Building 123 Components of RCRA Unit 40 (DOE 1997) but were not removed. Closure of the sump in Room 125 and the underground pipe from Room 158 did not meet the closure performance standards (RMRS 1998b) and were deferred to ER remediation. RCRA COCs at this location were metals and radionuclides.

RCRA closure accelerated action objectives were to remove all sumps and process waste lines associated with RCRA Unit 40 within the IHSS Group 100-4 AOC. Sumps located in former Rooms 156, 157, and 158 were removed, along with more than 1 foot of soil around and beneath the sumps. Pipelines between former Rooms 156 and 157 sump locations and more than 1 foot of soil around and beneath the pipelines was excavated. Additionally, approximately 40 feet of associated 4-inch-diameter stainless steel pipeline was excavated. Contamination was not detected on sumps or associated pipeline.

Confirmation samples were collected from the soil beneath each sump location, and one was collected in the pipeline trench between the Room 156 and 157 sump locations. Results indicated that americium-241 was slightly greater than background plus two standard deviations at one location, uranium-235 was slightly greater than background plus two standard deviations at one location, and uranium-238 was slightly greater than background plus two standard deviations at two locations. These data indicate that the sumps and pipelines had not leaked.

RCRA Unit 40 process waste lines were excavated and removed from the sumps to Manhole (MH)-2. The remaining pipeline south of MH-2 to Valve Vault 18 could not be removed because of infrastructure constraints. The sump (waste pumping station) in Room 125 was removed during decontamination and decommissioning (D&D) of the building. The following portions of RCRA Unit 40 were removed:

- Sumps in former Rooms 156, 157, and 158 and associated pipelines, and
- Process waste line from the sumps to MH-2

Residual Contamination

Accelerated actions for UBC-123 consisted of excavation of OPWL, NPWL, source pits, sumps, one RFCA Tier I lead exceedance, and one RFCA Tier I SVOC sum of ratio (SOR) exceedance. Residual contamination, consisting of confirmation sampling locations and pre-accelerated action sampling locations that were not remediated at UBC-123 are summarized in the Closeout Report (DOE 2003). Additional removal actions beyond ER RSOP Notification #IA-02-01 accelerated action goals (DOE 2002) were not required at IHSS 100-4 because of the following:

- Residual radionuclide activities in subsurface soil were less than RFCA Tier II and WRW ALs and only slightly greater than background plus two standard deviations
- Residual lead concentrations in subsurface soil were less than the Tier II and WRW ALs but were greater than the Ecological Receptor AL
- Residual SVOC concentrations were less than Tier II and WRW ALs
- Radionuclide activities in surface soil were less than Tier II and WRW ALs and only slightly greater than background plus two standard deviations (DOE 2003)
- A beryllium concentration in surface soil, outside of UBC 123, IHSS 148, and PAC 100-611 but within the AOC, at only one location and was 0.16 mg/kg greater than the RFCA Tier II AL but less than WRW and Ecological Receptor ALs
- Methylene chloride concentrations in subsurface soil, outside of UBC Site 123, IHSS 148, and PAC 100-611 but within the AOC were greater than the RFCA Tier II AL but less than the WRW AL at six locations

Site Reclamation

All excavated areas were backfilled and revegetated after confirmation sampling results were received and discussed with regulatory agencies through the consultative process. Excavated soil with radionuclide concentrations less than RFCA Tier II ALs was used as backfill in the trench that it was removed from. Additionally, 32 end-dump loads of topsoil from offsite sources were used to bring excavated areas up to grade.

The UBC-123 project area was rough graded before the topsoil was distributed over the site. The topsoil was graded, then scarified, and a seed mix consisting of Canada bluegrass was spread over the site using broadcast seeding methods. Hydromulch was applied to conserve moisture and prevent seed erosion.

Fate of Constituents Released to Environment

Sumps and process waste lines within UBC 123 were excavated and packaged for disposal. Confirmation sampling results for the soil beneath the sumps and process waste lines indicated

all contaminant concentrations were less than RFCA Tier II and WRW ALs Therefore, there is no actual or potential risk to human health or the environment

Action/No Further Accelerated Action Recommendation

Based upon characterization sample results collected in accordance with the IASAP Addendum #IA-02-01 (DOE 2001b), no potential contaminant or residual contaminant source could be identified

DOE received concurrence of NFAA status for IHSS Group 100-4 on April 22, 2003 (S H Gunderson letter to R DiSalvo)

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, CO, September

DOE, 1997, Closure Plan for Building 123 Components of RCRA Unit 40, Rocky Flats Environmental Technology Site, Golden, CO

DOE, 2000a, Final Sampling and Analysis Plan for the Characterization of Under Building Contamination for UBC 123 and Building 886 Implementing Horizontal Directional Drilling and Environmental Measurement While Drilling, Rocky Flats Environmental Technology Site, Golden, Colorado, May

DOE, 2000b, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, CO, September

DOE, 2001a, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, CO, November

DOE, 2001b, Final Data Summary Report for the Characterization of UBCs 123 and 886, Rocky Flats Environmental Technology Site, Golden, CO, September

DOE, 2001c, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, CO, June

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol Notification #02-01, Rocky Flats Environmental Technology Site, Golden, CO, January

DOE, 2003, Closeout Report for IHSS Groups 100-4 and 100-5, Rocky Flats Environmental Technology Site, Golden, CO, March

Gunderson, S H Letter to R DiSalvo, 1002, April 22

RMRS, 1997, Closure Plan for the Building 123 Components of RCRA Unit 40, Rocky Flats Environmental Technology Site, Golden, CO, November

RMRS, 1998a, Proposed Action Memorandum for the Decommissioning of Building 123, RF/RMRS-97-012, Rocky Flats Environmental Technology Site, Golden, CO, March

RMRS, 1998b, Closure Certification for the Building 123 Components of RCRA Unit 40, Rocky Flats Environmental Technology Site, Golden, CO, May

RMRS, 1998c, Final Close-Out Report, Building 123 Decommissioning Project RF/RMRS-98-253 UN, Rev 0, Rocky Flats Environmental Technology Site, Golden, CO September

PAC REFERENCE NUMBER: UBC 371

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	300-3
Unit Name	Building 371 Under Building Contamination
Approximate Location	N750,500, E2,082,000 (Building 371)

Date(s) of Operation or Occurrence

1981 - 2003

Description of Operation or Occurrence

Information on Building 371 is from the Historic American Engineering Record (HAER) (DOE 1998) Building 371 was the Plutonium Recovery Facility and is now the Interim Plutonium Storage/Repackaging Facility Building 371 went into operation in 1981 with a mission to (1) replace plutonium residue recovery and waste operations from Buildings 771 and 774, (2) recover plutonium from weapons returned from the stockpile, and (3) provide storage of plutonium and plutonium-bearing materials plutonium recovery operations in Building 371 were terminated in 1981 Since 1989, Building 371 has been used primarily for the storage of plutonium and uranium metals, oxides, residues, transuranic (TRU) wastes, low-level waste (LLW), and RCRA-regulated mixed waste and residues The remainder of this description is from the IASAP (DOE 2002a)

Past operations in Building 371 focused on the recovery of plutonium from Plant activities (nuclear weapons parts fabrication, component assembly, and research and development activities) Other operations included material transfer, waste incineration (radioactive wastes were never incinerated in Building 371, only simulated combustible wastes were incinerated), and laboratory support

Plutonium recovery operations used two different systems to separate high-purity plutonium metal from production-generated wastes 1) Pyrochemical processing and 2) aqueous processing Pyrochemical plutonium recovery (or pyrochemical processing) began in 1981 and ceased in 1988 Metal plutonium was processed through a pyrochemical operation in which americium was extracted from the plutonium by direct contact with molten salts If other impurities had to be removed, the extracted metal went to an electro-refining process where the plutonium was transformed by electrolysis in a molten-salt bath to an impure plutonium,

contaminated salt, and product metal of very high purity Impure metal was burned, converting it to an oxide, and processed through the aqueous chemical recovery systems

Dicesium hexachloroplutonate (DCHP) preparation took place for the purpose of converting plutonium oxide to reagent salt DCHP DCHP production in Building 371 began in 1989 and ceased operation in 1990 The DCHP preparation process involved dissolving plutonium oxide in hydrochloric acid and calcium fluoride and mixing filtrate with cesium chloride in hydrochloric acid and sodium nitrate

Aqueous plutonium recovery required a series of wet and dry chemical processing steps to produce plutonium, the oxide and other materials were dissolved in nitric acid (HNO_3) The HNO_3 recovery process consisted of tanks, gloveboxes, an evaporator, and distillation columns that were used to purify the large quantity of HNO_3 used in the metal recovery process The system experienced significant equipment problems

There were four plutonium analytical laboratories in the Building 371/374 Complex to support environmental, safeguards, and other regulatory requirements They include the liquids laboratory, standards laboratory, analytical laboratory, and liquid waste sampling laboratory The liquids and analytical laboratories are out of service Building 371 also housed plutonium analytical laboratories and a chemical standards laboratory, which supported operations throughout the Site The plutonium analytical laboratories served Buildings 371 and 374 and acted as a backup for the Building 771 analytical laboratory The majority of the work at this laboratory consisted of total alpha and beta counts along with radiochemical analyses for specific isotopes in liquid and solid samples These analyses served as a screening process to identify highly radioactive samples, which were unsuitable for detailed analyses in Building 881

The chemical standards laboratory in Building 371 prepared both nondestructive and destructive assay standards for various user groups at the Site, and inspected standards used in the field Most laboratory operations took place in gloveboxes Nondestructive assay standards were prepared for plutonium, americium, and uranium oxides and metals (including beryllium) for a wide range of instrumentation

The Building 371 Caustic Waste Treatment System (CWTS) treated both high- and low-level plutonium solutions from tank and pipe draining operations from Building 371 and Building 771 The shipping, receiving, storing, and retrieving of special nuclear material (SNM) occurred daily in Building 371 operations Two additional shipping and receiving docks are in the Support Facility on the southeastern corner Building 374 has two loading docks supporting operations SNM is stored in vaults or vault-type rooms in Building 371 The Central Storage Vault (CSV) extends through the subbasement and basement levels of Building 371 SNM received in liquid form was stored in CWTS tanks in Building 371

Residue and waste drum maintenance was conducted daily in Building 371 Residues and wastes were stored in many areas throughout Building 371 and the support facility

Several documented releases of materials to the environment have occurred at Building 371 and include the following

- Maintenance personnel discovered approximately 55 gallons of wastewater on the floor of Room 2217 on August 2, 1989. This incident resulted in the filing of a RCRA contingency plan implementation report (CPIR)
- A RCRA inspection of a 90-day accumulation area located in Room 3811 revealed that a metal 55-gallon drum containing dilute sulfuric acid solution had ruptured on December 20, 1989. This incident resulted in the filing of a RCRA CPIR

Physical/Chemical Description of Constituents Released

As described in IASAP Addendum #IA-03-01 (DOE 2002b), PCOCs at UBC 371 were determined based on process knowledge and data collected prior to the 2003 characterization. PCOCs included radionuclides, metals, SVOCs and VOCs. Characterization results indicate that all soil concentrations are below RFCA WRW ALs. Characterization data are presented in the Final Characterization Data Summary Report for IHSS Group 300-3 and 300-4 (DOE 2003).

Responses to Operation or Occurrence

Based on the characterization results, no accelerated action is required.

Fate of Constituents Released to the Environment

Results from the accelerated-action characterization, based on the Final Closeout Report for IHSS Groups 300-3 and 300-4 (DOE 2003), indicate that soil concentrations are less than the RFCA WRW ALs. In addition, the UBC is not located in an area susceptible to landslides or high erosion. Any migration of contaminants would not adversely impact surface water or groundwater quality.

Surface water and groundwater from IHSS Groups 300-3 and 300-4 flow towards North Walnut Creek. The distance from the northeast corner of Building 371 to North Walnut Creek at Monitoring Station SW 093 is approximately 3,000 feet. If COCs, radionuclides, metals, VOCs, and SVOCs (at relatively low concentrations) were to migrate to this surface water, either via erosion or groundwater transport, their concentrations at that point would most probably be too low to cause an exceedance of water quality standards. During transport, the metals of concern (arsenic and lead) would adsorb onto soil.

Based on historical and recent data, IHSS Groups 300-3 and 300-4 do not possess sources of groundwater contamination, and no contaminant plumes are in the area. Further groundwater evaluation will be conducted as part of the groundwater plume remedial decision and future sitewide evaluation.

Action/No Further Accelerated Action Recommendation

Based on the soil characterization results and the subsurface soil risk screen evaluation, there is no significant contaminant source in the UBC, and therefore, no actual or potential risk to human health or the environment. No long-term stewardship activities are recommended for UBC 371.

beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of UBC 371. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in UBC 371.

DOE received concurrence of NFAA status for IHSS Groups 300-3 and 300-4 on August 21, 2003 (S H Gunderson, letter, to R DiSalvo, 2003)

Comments

None

References

DOE, 1998, Historical American Engineering Record, Rocky Flats Environmental Technology Site, Golden, Colorado

DOE, 2002a, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2002b, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, 2003, Data Summary Report for IHSS Groups 300-3 and 300-4, Rocky Flats Environmental Technology Site, Golden, Colorado, August

Gunderson, S H, letter to R DiSalvo, 2003, August 21

PAC REFERENCE NUMBER: UBC 374

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	300-4
Unit Name	Building 374 Under Building Contamination
Approximate Location	N749,500, E2,084,000 (Building 374) [revise]

Date(s) of Operation or Occurrence

1970s to 2003

Description of Operation or Occurrence

(Original HRR [DOE 1992])

Information on Building 374 is included in the description of Building 371 (UBC 371) Building 374 houses the process waste treatment system and began operation in the 1970s Several documented releases of materials to the environment have occurred

- A solution of 40 percent dissolved nitrate salt overflowed Tank D-883-B on June 15, 1989, and ran into the process waste floor drains Process solution filled a glovebox, pushed out a window of the box, and approximately 50 gallons spilled onto the floor on November 23, 1989
- Approximately 100 gallons of process waste solution leaked from a pump and drained through a process floor drain on November 29, 1989
- Approximately 500 gallons of pH 12.6 solution of hydroxide salt leaked from a tank, some ran through cracks in the concrete floor to a hallway beneath the room
- Operator error led to a spill of brine concentrate, the spill was rinsed down the process drains
- Due to an inoperative floor drain, 150 gallons of brine concentrate spilled onto the floor of Room 3810

Physical/Chemical Description of Constituents Released

As described in IASAP Addendum #IA-03-01 (DOE 2002), PCOCs at UBC 374 were determined based on process knowledge and data collected prior to the 2003 characterization

PCOCs included radionuclides, metals, SVOCs, and VOCs. Characterization results indicate that all soil concentrations are below the RFCA ALs, with the following exception:

- The arsenic concentration at sampling location BZ45-003 (0 to 0.5 foot below the Building 374 slab) is 23.9 mg/kg, and the AL is 22.2 mg/kg.

Characterization data are presented in the Data Summary Report for IHSS Groups 300-3 and 300-4 (DOE 2003).

Responses to Operation or Occurrence

Based on the characterization results, no accelerated action is required. The one elevated arsenic concentration is very close to its AL and is within the background range. A lead exceedance occurred below the Building 371 slab, many feet below grade and poses no risk to human health.

Fate of Constituents Released to the Environment

Results from the accelerated-action characterization, based on the Final Closeout Report for IHSS Groups 300-3 and 300-4 (DOE 2003), indicate that soil concentrations are less than the RFCA ALs, with the one exception noted above. In addition, the UBC is not located in an area susceptible to landslides or high erosion. Any migration of contaminants would not adversely impact surface water or groundwater quality.

Surface water and groundwater from IHSS Groups 300-3 and 300-4 flow toward North Walnut Creek. The distance from the northeast corner of Building 374 to North Walnut Creek at monitoring station SW 093 is approximately 2,900 feet. If COCs (radionuclides, metals, VOCs, and SVOCs at relatively low concentrations) were to migrate to this surface water, either via erosion or groundwater transport, their concentrations at that point would most probably be too low to cause an exceedance of water quality standards. During transport, the metals of concern (arsenic and lead) would adsorb onto soil.

Based on historical and recent data, IHSS Groups 300-3 and 300-4 do not possess sources of groundwater contamination, and no contaminant plumes are in the area. Further groundwater evaluation will be conducted as part of the groundwater plume remedial decision and future sitewide evaluation.

Action/No Further Accelerated Action Recommendation

Based on the soil characterization results and the subsurface soil risk screen evaluation, there is no significant contaminant source in the UBC, and therefore, no actual or potential risk to human health or the environment. No long-term stewardship activities are recommended for UBC 374 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of UBC 374. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in UBC 374.

DOE received concurrence of NFAA status for IHSS Groups 300-3 and 300-4 on August 21, 2003 (S H Gunderson, letter, to R DiSalvo, 2003)

Comments

None

References

DOE, EPA, and CDPHE, 2003, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-03-01, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, 2003, Data Summary Report for IHSS Groups 300-3 and 300-4, Rocky Flats Environmental Technology Site, Golden, Colorado, August

Gunderson, S H , letter to R DiSalvo, 2003, August 21

PAC REFERENCE NUMBER: UBC 776 AND UBC 777

IHSS Number	Not applicable
Operable Unit	Industrial Area
IHSS Group	700-7
Unit Name	Building 776 Under Building Contamination and Building 777 Under Building Contamination
Approximate Location	N750,600, E2,083,800

Date(s) of Operation or Occurrence

1957 - 2002

Description of Operation or Occurrence

Information on Building 776/777 is from the HAER (DOE 1998) Building 776/777, which went into service in 1958, was the main manufacturing facility for plutonium weapons components and housed plutonium foundry and fabrication operations. Following a major fire in Building 776/777 in 1969, the majority of the foundry and fabrication operations were transferred to Building 707. After the fire, the main focus of building operations was shifted to waste and residue handling, disassembly of retired weapons components, and special projects. Processes conducted in Building 776 included size reduction, advanced size reduction, pyrochemistry, coatings operations, and test runs of organic waste and combustibles in a fluidized bed incinerator.

Beginning in 1958 and continuing through 1969, Building 776/777 was the main manufacturing facility for Plutonium weapons components and housed foundry and fabrication operations. Building 776/777 reflected the latest design criteria and engineering technology available when it was constructed. Since the facility was first occupied in 1957, 10 major modification additions were made to update the building and/or provide increased safety.

On May 11, 1969, at 2 27 p m , a fire was detected in Building 776/777 when an alarm in the north plutonium foundry glovebox line was triggered. Spontaneous ignition of a briquette of scrap plutonium alloy metal contained in a small metal can caused the fire. The fire spread through combustible materials in up to 150 connecting gloveboxes in Building 776 and the assembly line in Building 777. The fire was brought under control by 6 30 p m. Fearing a breach in the building's outer walls, firefighters used water to control the blaze. This was the first time water was used directly on burning plutonium and it did not create a nuclear criticality.

Scientists estimated an atmospheric plutonium release of approximately 0 000012 gram (0 0002 curie), all of it contained onsite. There were no immediate health effects to persons offsite. The operating areas in Building 776/777 suffered extensive damage. Decontamination took 2 years to complete. The incident resulted in significant safety improvements in glovebox operations, including installation of water sprinklers and firewalls to control the spread of fire, and the use of inert atmospheres for plutonium operations to prevent spontaneous ignition.

After the fire, the majority of the foundry and fabrication operations were transferred to Building 707. After several months of cleanup, limited production operations resumed in Building 776/777. The main operations conducted in the building became waste and residue handling, although operations such as disassembly of Site returns (nuclear weapons shipped to the Plant from the nuclear weapons stockpile for retirement, upgrade, or reprocessing) and special projects continued in the building as well. Processes conducted in the building included size reduction of contaminated gloveboxes and miscellaneous large equipment for waste disposal, pyrochemistry, coating operations, and test runs of a fluidized bed incinerator unit.

Physical/Chemical Description of Constituents Released

The major constituent released to the environment was plutonium (see above description). Also, in October 1964, a tagged-out valve was opened, allowing contaminated carbon tetrachloride to overflow a lathe box and flow through a crack in the floor, contaminating the room below.

Responses to Operation or Occurrence

After the fire, an extensive decontamination effort was undertaken that lasted approximately two years. Initial characterization activities were conducted during FY 2003 at the request of Building 776/777 Decontamination and Decommissioning personnel. Characterization activities were conducted in accordance with the IASAP (DOE 2001) and IASAP Addendum #IA-02-08 (DOE 2002). Samples from five locations were collected and analyzed.

Analytical results (DOE 2003) indicate that all contaminant concentrations were below the RFCAL soil ALs for the WRW and Ecological Receptors, with three minor exceptions. Three out of five surface soil samples had lead concentrations that exceeded the Ecological Receptor AL for lead. Concentrations ranged from 26.0 mg/kg to 28.7 mg/kg, and the AL is 25.6 mg/kg. The detected concentrations were within the background range. No accelerated action decisions were made based on this initial data set.

Fate of Constituents Released to Environment

The fate of constituents released to the environment is not known at this time. Additional characterization will be conducted to determine the nature and extent of contamination to make future environmental restoration action decisions. A subsurface soil risk screen and Stewardship Evaluation also will be conducted using data from the future characterization. Results will be used to determine if soil contamination exceeds RFCAL ALs and can result in exceedances of surface water quality standards.

Action/No Further Accelerated Action Recommendation

No accelerated action decisions were made based on the data collected to date
Recommendations will be made after future characterization and related data analysis

Comments

None

References

DOE, 1998, Historic American Engineering Record, Rocky Flats Environmental Technology Site

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2002, IASAP Addendum #IA-02-08, Rocky Flats Environmental Technology Site, Golden, Colorado, August

DOE, 2003, Characterization Data Summary, IHSS Group 700-3, Rocky Flats Environmental Technology Site, Golden, Colorado, June

PAC REFERENCE NUMBER: UBC 881

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	800-2
Unit Name	Building 881 Under Building Contamination, including Tank 39
Approximate Location	N748,500, E2,084,000 (Building 881)

Date(s) of Operation or Occurrence

1953 to 2001

Description of Operation or Occurrence

Information on Building 881 is from the HAER (DOE 1998) Initially known as Plant B, Building 881 was one of the four original manufacturing buildings that composed the Plant in the early 1950s and was the fourth building to come on line Beginning in 1953, this structure housed the Plant's only enriched uranium component manufacturing and recovery operations The original purpose of Building 881 was the processing and machining of enriched uranium (oralloy) into finished weapons components The oralloy process included chemical recovery operations and foundry equipment A large part of the early work at the Plant took place in this building, because the triggers required a large amount of enriched uranium

Fabrication and testing of stainless steel parts was conducted in Building 881 until 1984, when Building 460 was constructed Building 881 operations can be divided into three categories representing three distinct periods (1) enriched uranium manufacturing and recovery and special projects (1952-1966), (2) stainless steel operations (1966-1984), and (3) recent activities (post-1984)

Uranium recovery involved placing impure materials into HNO_3 for leaching and solvent extraction The materials were crushed into pea-sized feed in a rod mill and placed in dissolving tanks containing HNO_3 Solutions from the dissolution filters were concentrated in tall (three-story-high) solvent extraction columns that originated in a pit in the basement The solution was then pumped into various evaporators for further processing

Other recovery operations included incineration of combustible residues, reprocessing enriched uranium from site returns (weapons returned to the Plant for upgrade, reprocessing, or retirement), briquetting of relatively pure enriched uranium scraps, and recovery of enriched uranium fines from oil coolant systems Uranium -contaminated combustible materials such as wipes, cheesecloth used to clean up minor drips, wood, cardboard, and air filters were

incinerated White ash generated by the incinerator was sent to the slow recovery process side to recover enriched uranium

Beginning after 1960 and continuing until 1977, Building 881 housed the chemical recovery operations for site returns and rejected enriched uranium weapon components

A number of special projects ranging from ongoing research and development to one-time operations were conducted in Building 881 between 1953 and 1966 These projects included tracer components (processing of neptunium, curium, and cerium), uranium -233 processing, lithium fabrication, recovery of fuel rods, distillation, and cadmium plating of uranium parts

Stainless steel work at the Plant consisted primarily of fabrication of the reservoirs, tubes, and fasteners associated with the trigger delivery system, and the sealing of beryllium ingots into stainless steel containers as part of the beryllium wrought process Stainless steel work was transferred from Building 881 to Building 460 between 1983 and 1985 Conventional tools, such as lathes, mills, borers, and presses, were used in stainless steel machining operations After machining, fabricated parts were cleaned using solvents, acids, and aqueous detergents Equipment associated with the cleaning process included two vapor degreasers, and an ultrasonic cleaning unit After machining and cleaning, the parts were inspected and tested

Assembly operations were conducted in Building 881, although final assembly of some components was conducted in Building 707 Assembly operations included matching, brazing, welding, clinching pressure fittings, tube bending, wire winding, solid film applications, fixture assembly, vacuum bakeout, resin molding, and adhesive assembly

After stainless steel manufacturing was moved out of Building 881, the building became a multipurpose facility for research and development, computer support, analytical support, and administrative functions Building 881 housed the Plant's central computing facilities and general chemistry laboratory The laboratory provided general analytical and standards calibration, as well as development operations including waste technology development and testing of mechanical systems for weapons systems

Physical/Chemical Description of Constituents Released

As described in the IASAP Addendum #IA-02-04 (DOE 2002), PCOCs at UBC 881 were determined based on process knowledge and data collected prior to the 2002 characterization PCOCs included radionuclides, metals, PCBs, SVOCs and VOCs Characterization results indicate that all soil concentrations are below the RFCA ALs, with the following two exceptions

- The lead concentration at Location CF34-018 (0 – 0.5 foot below the Building 881 slab) is 1,150 mg/kg, and the AL is 1,000 mg/kg
- The benzo(a)pyrene concentration at Location CF35-035 (0 – 0.5 foot below the Building 881 slab) is 15,000 micrograms per kilogram (ug/kg), and the AL is 3,490 ug/kg

Characterization data are presented in the Final Characterization Data Summary Report for IHSS Group 800-2 (DOE 2003)

Responses to Operation or Occurrence

No action is necessary to remediate the elevated lead and benzo(a)pyrene concentrations. The lead and benzo(a)pyrene exceedances occur below the Building 881 slab many feet below grade, and it is very unlikely that the contamination would migrate to surface water and adversely impact water quality.

Fate of Constituents Released to the Environment

Results from the accelerated-action characterization, based on the Final Closeout Report for IHSS Group 800-2 (DOE 2003), indicate that soil concentrations are less than the RFCA WRW ALs, with the two exceptions noted above. Any migration of contaminants would not adversely impact surface water or groundwater quality. The southern part of UBC 881 is located near a hillside, and the at-grade soil in that area is susceptible to erosion. The site slopes southward and is located above the SID. However, soil below the Building 881 slab is located many feet below grade and is not susceptible to erosion.

Surface water and groundwater from IHSS Group 800-2 flow toward the SID and Woman Creek. The distance from the south side of Building 881 to the SID is approximately 525 feet. If contaminants of concern (i.e., radionuclides, metals, VOCs and SVOCs at relatively low concentrations) were to migrate to these surface waters, either via erosion or groundwater transport, their concentrations at that point would be very low and probably would not cause an exceedance of water quality standards. During transport, the metals of concern would adsorb onto soil, and benzo(a)pyrene breaks down in a few weeks.

Action/No Further Accelerated Action Recommendation

Based on the soil characterization results and the subsurface soil risk screen evaluation, there is no significant contaminant source in the UBC, and therefore, no actual or potential risk to human health or the environment. No long-term stewardship activities are recommended for UBC 881 beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of UBC 881. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in UBC 881.

DOE received concurrence of NFAA status for IHSS Group 800-2 on July 16, 2003 (S H Gunderson, letter, to R. DiSalvo, 2003).

Comments

None

References

DOE, 1998, Historical American Engineering Record, Rocky Flats Environmental Technology Site, Golden, Colorado

DOE, 2002, Industrial Area Sampling and Analysis Plan Addendum #IA-02-04, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2003, Final Characterization Data Summary Report for IHSS Group 800-2, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H , letter to R DiSalvo, 2003, July 16

PAC REFERENCE NUMBER: UBC 886

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	800-4
Unit Name	UBC 886, Critical Mass Laboratory
Approximate Location	N749,150, E2,084,000

Date(s) of Operation or Occurrence

1965 - 1998

Description of Operation or Occurrence

Information on Building 886, Critical Mass Laboratory, is from the HAER (DOE 1998) Building 886 was commissioned in 1965 to house the Nuclear Safety Group, which performed criticality experiments on a variety of fissile materials to establish criticality limits and ensure safe handling and processing during Site operations

Approximately 1,700 critical mass experiments were conducted in Building 886 between 1965 and 1987. Highly enriched uranium (HEUN) was introduced into the building in the summer of 1965, and the first experiments were performed in September 1965. Subsequently, the building was used to perform experiments on enriched uranium metal and solutions, plutonium metal, and low-enriched uranium oxide. After 1983, experiments were conducted primarily with uranyl nitrate solutions.

Typical critical mass experiments conducted in Building 886 involved removing the fissile material from storage, placing it in one of the reactivity addition devices, operating the device remotely until criticality was achieved, measuring the slightly supercritical parameters, reversing the operation of the device to slightly subcritical, and returning the fissile material to storage. The experiments were conducted in a controlled manner and generally involved power levels of no more than 10 milliwatts for no more than one hour. Approximately one-half of the experiments conducted in Building 886 actually achieved criticality.

Other experiments were performed to validate safety parameters for the storage of fissionable solutions in raschig ring tanks, resulting in the design of two substitute storage tank configurations: the annular tank and point tube tank. These designs allowed for more economical solution testing with no decrease in safety. Experiments were also conducted to validate the cross-sections and usefulness of materials used at the Site.

The work performed in Building 886 supported the Site's nuclear weapons production activities and assisted the U.S. Nuclear Regulatory Commission in setting industry safety standards. The measurements were essential to validate computer models that were, in turn, used to establish nuclear criticality safety operating limits at DOE facilities.

Physical/Chemical Description of Constituents Released

No releases reported.

Responses to Operation or Occurrence

Based on historical information regarding the building, surface and subsurface soil was sampled and analyzed for metals, radionuclides, SVOCs, and VOCs in accordance with the IASAP Addendum #IA-02-03 (DOE 2002).

Building 886 was decommissioned in accordance with the IM/IRA Action Plan for the Building 886 Cluster (RMRS 1998).

Fate of Constituents Released to Environment

(Annual Update for the HRR [DOE 2001])

No documentation was found that detailed the fate of constituents that may have been released from the operations conducted within Building 886.

Action/No Further Accelerated Action Recommendation

Based upon the results of the soil samples collected, no current or potential contaminant source was identified. As described in the Final Closeout Report for IHSS Group 800-4 (DOE 2003), analytical results from the previous and the most recent sampling events show that all PCOCs are less than RFCA ALs (DOE et al. 2003) except lead, which was the only contaminant that exceeds the RFCA Ecological Receptor AL. There are no immediate pathways to surface water or erodible areas at this location.

DOE received concurrence of NFAA status for IHSS Group 800-4 on May 15, 2003 (S.H. Gunderson, letter, to R. DiSalvo, 2003c).

Comments

Building 886 was demolished in 2002.

References

DOE, 1998, Historical American Engineering Record, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2001, Annual Update for the Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, Colorado, September.

DOE, 2002, Industrial Area Sampling and Analysis Plan 2002, Addendum #IA-02-03, Rocky Flats Environmental Technology Site, Golden, Colorado, March

DOE, 2003, Final Closeout Report for IHSS Group 800-4, Rocky Flats Environmental Technology Site, Golden, Colorado, February

DOE, CDPHE and EPA, 2003, Rocky Flats Cleanup Agreement Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June

Gunderson, S H , letter, to R DiSalvo, 2003, Approval of IHSS Group 800-4 Closeout Report, May 15

RMRS, 1998, Interim Measure/Interim Remedial Action Plan for the 886 Cluster, Rocky Flats Environmental Technology Site, Golden, Colorado, July

PAC REFERENCE NUMBER: UBC 889

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	800-6
Unit Name	Building 889 Under Building Contamination, including Tank 28
Approximate Location	N749,100, E2,083,800 (Building 889)

Date(s) of Operation or Occurrence

1969 to 2000

Description of Operation or Occurrence

Building 889 was placed into service in 1966. It housed decontamination and waste reduction operations for wastes originating outside the PA. Wastes entering Building 889 included surplus equipment that would be decontaminated by steamcleaning for reuse on site or sale off site. High-efficiency particulate air (HEPA) filters, combustible wastes, and nonreusable equipment were compacted, placed in crates, and shipped off site for disposal.

Building 889 contained two concrete sumps within the concrete slab. The sumps were designated as Tank 28 and were connected to the Original Process Waste Lines, which ran to Tank 40.

Physical/Chemical Description of Constituents Released

As described in the IASAP Addendum #IA-02-01 (DOE 2001), PCOCs at UBC 889 were determined based on process knowledge and included uranium, metals, VOCs, and SVOCs. Soil was sampled and analyzed in accordance with IASAP Addendum #IA-02-01 and characterization results indicate that contaminant concentrations were less than the RFCA ALs. Preaccelerated action and accelerated action data are presented in the Final Closeout Report for IHSS Group 800-6 (DOE 2003).

Responses to Operation or Occurrence

Notification of the planned accelerated action was provided in the ER RSOP Notification #02-02 (DOE 2002). Activities were conducted between April 19 and July 18, 2002, and included removal of the Building 889 slab, footer walls, footers, sumps, tanks, and waste lines, as well as site grading and vegetation. Tank 28 was removed. Surface and subsurface soil samples were

collected and analyzed after the removal activities Details and analytical results are provided in the Final Closeout Report for IHSS Group 800-6 (DOE 2003)

Fate of Constituents Released to the Environment

Results from the accelerated action characterization (DOE 2003), indicate that soil concentrations are less than the RFCA ALs Any migration of contaminants would not adversely impact surface water or groundwater quality

Action/No Further Accelerated Action Recommendation

Based on the actions taken and soil characterization results, there is no contaminant source in the UBC, and, therefore, no actual or potential risk to human health or the environment No long-term stewardship activities are recommended for UBC 889 beyond the generally applicable Site requirements that may be imposed on this area in the future Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of UBC 889 No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining in UBC 889

DOE received concurrence of NFAA status for IHSS Group 800-6 on March 25, 2003 (S H Gunderson, letter, to R DiSalvo, 2003)

Comments

None

References

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol Notification #02-02, Rocky Flats Environmental Technology Site, Golden, Colorado, February

DOE, 2003, Final Closeout Report for IHSS Group 800-6, Rocky Flats Environmental Technology Site, Golden, Colorado, March

Gunderson, S H , letter to R DiSalvo, 2003, Final Closeout Report for IHSS Group 800-6, March 25

PAC REFERENCE NUMBER: 991 TUNNEL

IHSS Number	Not Applicable
Operable Unit	Industrial Area
IHSS Group	900-1
Unit Name	991 Tunnel
Approximate Location	N750,100, E2,085,000 (Building 991)

Date(s) of Operation or Occurrence

1952 to 2003

Description of Operation or Occurrence

Information on Building 991, including its tunnels, is from the HAER (DOE 1998) Building 991, constructed between 1951 and 1952, was the first major building to be completed Building 991 was designed for shipping and receiving and final assembly of weapon components Plutonium, enriched uranium, and depleted uranium components fabricated onsite, along with components manufactured from the Hanford Site and the Oak Ridge Reservation, were assembled into final products, inspected, tested, and placed back in storage prior to offsite shipment in Building 991 Administrative services for the Plant were also carried out in Building 991 until Building 111 was completed in 1953

Initially, radioactive components were coated in nickel or encased in plastic allowing assembly of the early concept design products in open rooms, not in enclosed gloveboxes or B-boxes (similar to a lab hood) In 1957, production began on a new weapon design, requiring changes in the amount of materials used in the trigger, amount of machining and handling required, and need for tighter controls Because of the new design, final trigger assembly took place in the newly constructed Building 777 Assembly of older uranium-based weapons continued in Building 991 until the 1960s A limited number of uranium-based triggers may have been assembled in Building 991 during the early 1960s

After 1957, the mission of Building 991 focused on shipping, receiving, and storage. Materials handled included special nuclear, non-radioactive raw, and classified materials, other metal components, partially finished products, purchase order items, special order items, samples, instruments, and documents All radioactive materials received and stored in Building 991 were in U S Department of Transportation, DOE, or intra-plant-approved shipping containers For a brief period of time, between 1975 and 1976, shipping was moved to Buildings 439 and 440 Due to security concerns, shipping was moved back to Building 991 after 1976

In addition to material shipping, receiving, and storage, a number of research and development projects were conducted in Building 991 from the 1960s to the mid-1970s. These projects included radiation studies, beryllium coating processes, and an explosives-forming project. Most special projects and research and development operations were moved out of the building by 1976.

Building 991 was used to test the quality of non-nuclear raw material and non-nuclear non-classified parts fabricated by offsite vendors. A metallography laboratory was used for the testing. In the mid-1970s, Building 991 took over storage and inventory functions from Building 881 for these non-nuclear raw materials and non-nuclear, non-classified parts. In the late 1980s, handling of non-classified materials parts was moved to Buildings 130 and 460. Materials and parts ready for assembly were moved directly to Building 460.

Until the mid-1980s, materials were shipped and received from the eastern dock areas (Room 166). The west dock was added in the mid-1980s to provide a covered shipping area specifically designed for the safe secure transports used to ship production materials.

Until 1994, when a special loading dock was added to Building 371, Building 991 had the only shipping/receiving dock at the Plant capable of handling offsite shipments of special nuclear and classified materials. The building also housed nondestructive testing operations and other support operations. Radioactive and non-radioactive raw materials, special order items, packaging items, components, and samples were stored in the Building 991 vaults. All non-nuclear and nuclear materials sent to Building 991 were handled in Rooms 170 (shipping dock) and 134. Primary materials handled include 55-gallon and 30-gallon drums of uranium and plutonium parts from offsite and onsite parts.

The final activity in Building 991 was waste storage.

Physical/Chemical Description of Constituents Released

As described in IASAP Addendum #IA-03-05 (DOE 2003), PCOCs at UBC 991, were determined based on process knowledge and data collected prior to the 2003 characterization. PCOCs included radionuclides, metals, and VOCs. Characterization results for the 991 Tunnel indicate that all soil concentrations are below the WRW ALs. Characterization data are presented in Figure 2.19.

Responses to Operation or Occurrence

Based on the characterization results, no accelerated action is required.

Fate of Constituents Released to the Environment

Results from the accelerated-action characterization, shown on Figure 2 19, indicate that soil concentrations are below the RFCA WRW ALs. In addition, the area under the 991 Tunnel is not located in an area susceptible to landslides or high erosion. Because contaminant concentrations are low, any migration of contaminants would not adversely impact surface water or groundwater quality.

Surface water from the 991 Tunnel flows towards South Walnut Creek via Monitoring Station GS10 (a RFCA Point of Evaluation), Pond B-4, and GS08 (a RFCA POC). The distance from this portion of UBC 991 to GS10 is approximately 1,460 feet. If COCs (radionuclides, metals and VOCs at relatively low concentrations) were to migrate to this surface water, either via erosion or groundwater transport, their concentrations at that point would most probably be too low to cause an exceedance of water quality standards. However, exceedances of water quality standards have been detected at GS10. GS10 receives water from a large part of the IA, and surface water quality at GS10 can not be attributed to any single IHSS Group based on existing data.

Based on historical and recent data, the area under the 991 Tunnel does not possess sources of groundwater contamination, and no contaminant plumes are in the area. Further groundwater evaluation will be conducted as part of the groundwater plume remedial decision and future sitewide evaluation.

Action/No Further Accelerated Action Recommendation

Based on the soil characterization results, there is no significant contaminant source under the 991 Tunnel, and therefore, no actual or potential risk to human health or the environment. No long-term stewardship activities are recommended for the 991 Tunnel beyond the generally applicable Site requirements that may be imposed on this area in the future. Institutional controls that will be used as appropriate for this area include prohibitions on construction of buildings in the IA, restrictions on excavation or other soil disturbance, and prohibitions on groundwater pumping in the area of the 991 Tunnel. No specific engineered controls or environmental monitoring are anticipated as a result of the conditions remaining under the 991 Tunnel.

DOE received concurrence that NFAA is necessary for the 991 Tunnel, Tunnel 996, and Buildings 996, 997 and 999 on August 21, 2003 (S H Gunderson, letter, to R DiSalvo, 2003).

Comments

None

References

DOE, 1998, Historical American Engineering Record, Rocky Flats Environmental Technology Site, Golden, Colorado

DOE, 2003, Industrial Area Sampling and Analysis Plan Addendum #IA-03-05, Rocky Flats
Environmental Technology Site, Golden, Colorado, February

Gunderson, S H , letter to R DiSalvo, 2003, August

Section 3

3.0 Other Significant Events

This Section describes specific events, occurrences and projects that have taken place during the reporting period for this annual update. The event descriptions are brief summaries and may be useful for future projects and in support of Site closure.

3.1 CDPHE Buffer Zone Contamination Report

Rocky Flats Response to Concerns:

This section was prepared by the Site to document the disposition of 36 sites questioned by CDPHE in an August 1999 Report as being of possible environmental concern. This section provides background information regarding Site/CDPHE correspondence, a summary of the process for identification of historical release sites, and a proposed resolution for each "area" or "site" identified by CDPHE as potentially being of environmental concern.

Concerns for many of the sites were resolved at the January 10, 2001 meeting and agreements were reached to resolve concerns for all of the areas identified by CDPHE.

Background

CDPHE released a report on their website entitled, Buffer Zone Contamination Review Technical Report, dated August 23, 1999 (BZ Report). The study was intended to be a review of information contained in various documents to ascertain whether additional potentially contaminated areas might exist in the BZ, beyond those areas that have currently been identified as PACs or IHSSs. In the report, CDPHE identified 30 additional areas that may have possible environmental concerns and 6 currently identified areas that may have additional concerns. The report stated that identification of additional areas of possible concern does not necessarily mean that these newly identified areas contain contamination or that they are necessarily the result of unreported activities performed at Rocky Flats. Rather, these areas may be the result of natural events, or they may have been identified but the activities associated with these sites are not adequately documented at this time.

The Site responded in a December 21, 1999 letter from J. Legare of DOE to S. Gunderson and S. Tarleton of CDPHE. An Assessment and Response to the CDPHE report was provided as an attachment to the letter. In the letter, DOE stated that the 36 areas were reviewed internally by comparing the information presented against other aerial photographs, Site knowledge, and documented sampling where available. Based on this review, the Site determined that 8 of the 36 areas identified by CDPHE either have work currently associated with them or will be followed up on in the future. The remaining 28 areas do not require further action.

On March 15, 2000, D. Kruchek of CDPHE sent an email memorandum (March 15, 2000 memo) to T. Greengard of the Site. The memorandum contained draft comments in response to the previous correspondence and was provided to help guide discussions at a meeting planned to discuss areas in the BZ that CDPHE and EPA still have questions about. The State and EPA had met previously to discuss the CDPHE report. The meeting was held January 10, 2001 as a technical meeting and included the review of aerial photographs. The purpose of the Site/CDPHE/EPA meeting was to reach agreement on all areas of potential concern.

Identification of Historical Release Sites

The following discussion of the programs dedicated to identifying potential historical release sites at Rocky Flats is presented to summarize the comprehensive and in-depth effort that has gone into identifying potential releases at RFETS over the last 15 to 30 years

In responses to several of the findings, the CEARP is referenced. The CEARP was the precursor to the Environmental Restoration Program within DOE, and was based on CERCLA process. The CEARP comprehensively identified and evaluated actual and potential waste sites and contamination incidents including leaks and spills. The CEARP Phase I Installation Assessment Report was released in April 1986. The Phase I Report focused on whether waste disposal practices or other operations resulted in environmental problems that require remedial action. The CEARP Phase I Report was based on a records search, open literature survey, employee interviews, preliminary assessments, and site inspections. The Phase I Report provided documentation for CERCLA pre-remedial activities including Federal Facility Site Discovery and Identification Findings, Preliminary Assessments, Site Inspections, and Hazard Ranking System evaluation. The Phase I investigations were performed by personnel of the Los Alamos National Laboratory (LANL) for DOE Albuquerque Operations. At the time, DOE-Headquarters (HQ) and Albuquerque Operations were conducting environmental contamination assessments for all the weapons sites under their jurisdiction, which included Rocky Flats. DOE and Contractor personnel at Rocky Flats provided assistance, but not direction, to the LANL investigation.

As part of the records search, documents were reviewed and evaluated in the categories of environmental reports, management plans, monitoring reports, permits, operational records, standard operating procedures, appraisals, audits, inspections, special reports, historical documents, accident/incident investigation reports, and internal files. Key historical documents that were reviewed included "A Summary of Onsite Radioactive Waste Disposal" (Putzier 1970) and "Environmental Inventory: A Historical Summation of Environmental Incidents Affecting Soils at or Near the USAEC Rocky Flats Plant" (Owen and Steward 1973).

Former and current Site employees with knowledge of Site operations were identified and screened to determine who should be interviewed. Eighty-four employees familiar with production, facilities, site services, research, waste management, and environmental operations were interviewed. These individuals were interviewed to identify waste disposal operations, past leaks or spills, and undocumented incidents or practices that could have resulted in environmental concerns. Information from the interviews covers the complete history of operations at the Site from 1951 through 1984 and is included in the CEARP Phase I Report.

In addition to the CEARP Installation Assessment Report, a HRR was prepared in June 1992. The HRR was updated quarterly under the IAG until 1996. Since then, the HRR has been updated annually under the RFCA. The purpose of the HRR is to report, summarize, and update existing and/or new information on incidents involving hazardous substances at Rocky Flats. The information in the HRR is used by EPA and CDPHE to determine whether sites potentially affected by incidents, known as PACs, IHSSs, and UBC Sites require or warrant further

investigation and/or remediation IHSSs are defined as individual locations where hazardous substances have come to be located at a discrete area within the Site

Identification and characterization of hazardous material releases are determined by background research, comprehensive review of DOE and contractor files, interviews with current and former Site employees, review of photographs, and site inspections Thousands of documents have been reviewed and several hundred employees have been interviewed as part of the HRR process The HRR process has verified and augmented previous IHSS documentation, and identified potential new sites that may present an impact to human health and the environment

The photographs and preliminary photographic interpretations of disturbed areas at Rocky Flats contained in the EPA Photo Report of 1988 were reviewed during the initial HRR investigations The EPA Photo Report is cited extensively in, and is the basis of, the CDPHE BZ Report

Resolution of Concerns

In the following sections, CDPHE concerns and responses to those concerns have been summarized to facilitate final resolution of the concerns raised in the BZ Report

Concerns for many of the sites were resolved at the January 10, 2001 meeting, and agreements were reached to resolve concerns for all of the areas identified by CDPHE This document has been revised to resolve concerns for all of the sites as agreed at the January 10, 2001 meeting Refer to the meeting minutes for the resolution of concerns and agreements for each site

SITE #1 - Disturbed ground immediately southeast of the IA identified as the former small arms range (see CDPHE Buffer Zone Report, Appendix 2, #1 and 64)

Resolution: This site is the Old Firing Range It has been designated as a new PAC, number SE-1602 It is addressed in the 1999 Annual Update to the HRR DOE will prepare an ER RSOP Notification for the removal of bullets and associated debris at SE-1602 in FY04

3.4 Specific Events and Occurrences

This section describes specific events, occurrences and projects that have taken place during the reporting period for this annual update The event descriptions are brief summaries and may be useful for future projects and in support of the Sites closure

3.4.1 RFCA Attachment 5 Modification

EPA, CDPHE, and DOE approved modifications to RFCA Attachment 5 on June 5, 2003 The modifications impacted soil action levels, added a subsurface soil screen, and action/no further accelerated action determinations Refer to RFCA Attachment 5, dated May 28, 2003 for details Attachment 14, which covers OPWL characterization and remediation, was also added

3.4.2 Closure of the SEP (IHSS 000-101)

Closure of the SEP at RFETS, was proposed under alternative RCRA Interim Status closure requirements found in 6 Colorado Code of Regulations (CCR) 1007-3, 265 110(d), because a release from the SEP has occurred and releases from other units in the area of the SEP have also

contributed to this contamination. This alternative approach allowed contamination from the units within this area to be evaluated holistically as one AOC, and allowed RCRA closure using a risk-based analysis and compliance with the closure performance standards in 6 CCR 1007-3, 265 111 (a) and (b). A risk assessment was performed based on identified contaminants of concern within the AOC and these findings were approved in a PAM (DOE 2003).

The risk assessment included an evaluation of existing soil and pond liner material analytical data, which was collected during previous field investigations and site-wide sampling programs. These data were screened and Contaminants of concern were selected and evaluated to determine risk posed to future WRWs. Based on the results of the risk assessment, the cumulative hazard index (HI) for non-carcinogenic health effects was well below 1 at 0.04. The total cancer risk to a WRW due to RCRA constituents was below 1 excess cancer case per 1 million exposed individuals ($1E-06$) at $4E-07$. The total cancer risk to a WRW due to radionuclides was $3E-06$, with the major contributor to risk being americium-241 and uranium-238.

Groundwater contamination will be addressed in a separate IM/IRA decision document.

The other units within the AOC were removed as a separate action under the ER RSOP Notification 02-08 (DOE 2002b). These components included the removal of concrete slabs, above-grade lines, segments of below grade lines, valve vaults, collection sumps, manholes, electrical control conduit and other utilities, associated support racks, concrete ramps and barriers. To determine whether contamination was present at specific locations where soil or component removal was anticipated, an IASAP Addendum was also submitted (IASAP Addendum 02-07 [DOE 2002d]). Soil with contaminant concentrations greater than RFCA Tier I ALs and associated debris were removed in accordance with RFCA and the ER RSOP. In addition, lysimeters and unneeded groundwater monitoring wells were abandoned as a separate action under the Well Abandonment and Replacement Program (WARP) (K-H 2002).

Based on applying the alternative closure requirements, the results of the risk assessment indicate RCRA constituents pose less than $1E-05$ residual risk for a WRW and with the completion of the actions performed under the ER RSOP and IASAP, the SEP meet the closure performance standards of 6 CCR 1007-3, 265 111(a) and (b). In addition, the radiological contaminants remaining within the SEP AOC soil, are all below RFCA Tier I and are below $1E-05$ risk to a WRW.

Remediation of the Solar Ponds was completed in December of 2002. The berms were pushed in and the site was graded after approximately 800 tons of low-level mixed concrete and soil were removed. Approximately 65,000 yard of clean soil were used for backfill prior to reseeding.

3.5 IHSSs SW-115 and 000-114 - The Original and Present Landfills

3.5.1 The Original Landfill

Work continues on the preparation of a draft Original Landfill IM/IRA to submit for public comment. Subsequent to the public comment period a geotechnical investigation and design is planned for FY04 with construction beginning in FY05.

3.5.2 The Present Landfill

Work continued on the Present Landfill IM/IRA in response to the comments received during the public comment period. Currently a Subtitle C RCRA compliant cover is being considered instead of the previously proposed evapotranspiration cover. The revised IM/IRA will be submitted for a second public comment. Subsequently the design and construction of the cover will be performed in FY 2004.

3.6 903 Pad Remediation

The 903 Pad Drum Storage Area (IHSS Site 112) is a 3.4-acre area where drums containing radiologically contaminated oils and VOCs were stored from 1958 to 1967. Approximately three fourths of the drums contained liquids contaminated with plutonium, while most of the remaining drums held liquid containing uranium. Drum removal and cleanup operations began in 1967, at which time more than 5,000 drums were at the site. Approximately 450 drums had leaked to some degree, and an estimated 50 drums had leaked their entire contents. After the drums were removed the area was leveled with road base and capped with a 6-inch thick layer of asphalt.

On November 14, 2002 remediation activities began to remove the asphalt, road base and underlying contaminated soils. For excavation and sampling purposes, the asphalt pad was subdivided into 225 grid cells approximately 26-feet square. After excavating the asphalt and road base as low-level radiological waste, the underlying soil was excavated and sampled until plutonium contamination levels were below 50 pCi/g.

All excavation activities were conducted inside of weather structure tents containing HEPA filter ventilation system. The tents are designed to move around the pad by towing with large loaders. Because of the uncertainty of the VOC concentration in the soil, and carbon monoxide from the heavy equipment, workers inside the weather tents have supplied air respiratory protection.

To date, the project has completed remediation of 175 grid cells and approximately 1,445 intermodal containers were filled with soil and asphalt for a total weight of 22,300 tons. All excavations were backfilled with clean imported soil.

3.7 903 Pad Outer Lip Area Precision Soil Vacuum

The Phase III demonstration of the precision soil vacuum technology is currently underway to determine if this technology is a cost effective method to remove low-level radiological impacted surface soil at the 903 Pad Outer Lip Area. The soil vacuum technology is being compared with conventional excavation techniques. The perceived benefits of the soil vacuum technology over conventional techniques include less waste volume, less erosion after excavation and a faster recovery of the vegetation within the excavation area. However, based on the depth of required excavation (greater than 2-inches), existing limited vegetation, and the labor required to conduct the work in less than a year, soil vacuum technology may not be appropriate for the Outer Lip area of the 903 pad.

3.8 The Original Plant Incinerator Uncovered

On April 8, 2003, a project was initiated in the Woman Creek Drainage near the Ash Pits (IHSSs 133 1, 133 2, 133 3 133 4 and SW-1702) to remove concrete pours, which were spoiled over the hillside and at the base of the drainage. In the early 1970s the areas were selected for concrete cement trucks to utilize as a dumping and cleaning area during large construction projects. The concrete pours were known to be covering both the Concrete Wash Pad (IHSS SW-133 6) and the Original Plant Incinerator location (IHSS SW-133 5), up to 12 feet thick in areas, which prohibited previous or earlier access to these IHSSs for sampling. Approximately 3,500 yd³ of concrete was removed from the area. Of that, approximately 40 yd³ of the concrete spoil did not meet the unrestricted release criteria and currently remain in the area. Over 3,400 yd³ of concrete meeting the unrestricted release criteria was broken up and hauled to the 850 concrete recycle and storage area.

The southern edge of the incinerator was uncovered on April 24, 2003 while breaking up the thick overburden concrete flows within IHSS 133 5 (it was not anticipated that the entire structure would be intact). However, by the end of the day, workers were able to safely expose nearly all of the southern face of the incinerator. The dimensions of the Incinerator are roughly 13 feet by 13 feet with a height of approximately 24 feet. When the unit was constructed in 1952, it had an additional 30-foot stack emerging from a portion of the roof. The stack was removed in the late 1960's and from that point forward, it was unclear how much (if any) of the actual unit was dismantled. The incinerator was primarily used to burn general office paperwork, classified and sensitive information and small quantities of depleted uranium combustibles. Samples were taken around the exposed incinerator and the data is currently being reviewed in conjunction with planning and approval to demolish the unit.

3.9 Demolished Rocky Flats Buildings through September 27, 2002

Table 3 1 is a comprehensive list of buildings located at RFETS, which have been demolished during the 2003 fiscal year. The list is included in the HRR reporting process because some IHSSs, PACs, and UBC sites are located immediately within or under some facilities.

Table 3.1
Demolished Rocky Flats Buildings through September 2, 2003

Property Identifier	Property Name	Demolished	Date Demolished
828	Process Waste Pit B886 Low Level Inactive	Yes	May 21, 2002
Tank 333	Propane Tank, Tent 14 Pond A-4, NDT 2979	Returned to Vendor	May 21, 2002
T428B	Trailer	Sold	May 23, 2002
T452E	Rest Rooms	Yes	May 23, 2002
T690N	Trailer - Administration	Sold	May 30, 2002
T900E	Trailer - OU-2 Soil Vapor Extraction (SVE) Unit	Sold	May 30, 2002
T891D	Trailer (Offices)	Sold	May 31, 2002
Tank 332	Propane Tank, Tent 14 Pond A-4, NDT 2978	Return to Vendor	June 06, 2002
Tank 115	Propane Storage Tank, NDT 2300, north of 335	Return to Vendor	June 11, 2002
Tank 331	Diesel Blend, Tent 14 Pond A-4, NDT 2980	Return to Vendor	June 11, 2002
T452A	Trailer (Offices)	Yes	June 17, 2002
T452B	Trailer (Offices)	Yes	June 17, 2002

Item ID	Description	Status	Date
T452G	Trailer (Offices)	Yes	June 17, 2002
T452C	Trailer (Offices)	Yes	June 18, 2002
T452D	Trailer (Offices)	Yes	June 18, 2002
880	Storage Shed	Yes	June 24, 2002
850	Logistics/Office Space/Cafeteria	Yes	June 26, 2002
864	Guard Union Office (former Guard Post))	Yes	July 02, 2002
875	Filter Plenum B886 Zone 1	Yes	July 08, 2002
889 Pad	889 Concrete Pad	Yes	July 08, 2002
Tank 312	Process Waste Sump (UST 62 aka 889W-1 and T-28 - B889) below grade concrete tanks located in room 108 that historically contained radionuclides and were converted for use as sumps to collect liquids from steam cleaning, UST notification 4/86, RCRA exempt	Yes	July 08, 2002
Tank 313	Process Waste Sump (UST 63 aka 889W-2 and T-28 - B889) below grade concrete tanks located in room 108 that historically contained radionuclides and were converted for use as sumps to collect liquids from steam cleaning, UST notification 4/86, RCRA exempt	Yes	July 08, 2002
Tank 018	Process Waste Tank, south of 884, west of 889 Pad, within concrete pad T-40 North and South foamed 7/25/96 (RF/ER-96-0050) RCRA unit closure required	Yes	July 08, 2002
Tank 019	Process Waste Tank, south of 884, west of 889 Pad, within concrete pad, T-40 North and South foamed 7/25/96 (RF/ER-96-0050) RCRA unit closure required	Yes	July 08, 2002
442 Pad	442 Concrete Pad	Yes	July 09, 2002
452	Human Resources Office Building	Yes	July 09, 2002
T452 Pad	T452 Pads (trailers D&D'd)	Yes	July 18, 2002
452 Pad	452 Pad (facility D&D'd)	Yes	July 29, 2002
Tank 175	Liquid Nitrogen Storage Tank (north of 771C)	Returned to Vendor	July 31, 2002
Tank 176	Sodium Hydroxide Tank, NDT 1412, north of Building 774 (aka 774T)	Yes	July 31, 2002
662	Storage (Plant Power)	Yes	August 01, 2002
663	Storage and Shipping	Yes	August 01, 2002
381	Fluorine Building	Yes	August 06, 2002
Tent 14	A-4 Pond Storage Tent, a k a Building 944	Yes	August 08, 2002
T893A	Trailer (Offices)	Yes	August 09, 2002
T893B	Trailer (Offices)	Yes	August 15, 2002
T891F	Trailer (Offices)	Sold	August 23, 2002
T886C	Trailer (Offices)	Yes	August 26, 2002
910-G2	Gas Generator 2 - Building 910 (middle)	Sold	August 27, 2002
910-G3	Gas Generator 3 - Building 910 (south)	Sold	August 27, 2002
T886B	Trailer (Offices)	Yes	August 28, 2002
T891E	Trailer (Offices)	Yes	September 4, 2002
T891P	Trailer (Offices)	Yes	September 4, 2002
T891Q	Trailer (Shower)	Yes	September 4, 2002
910-G1	Gas Generator 1 - Building 910 (north)	Sold	September 6, 2002
262	No 2 Diesel Fuel Storage Tank (Abandoned Mar 1999), aka D-262, UST 4, northeast of 381, aka Tank 4 -does not need to be removed if 3 feet below grade - Closure Report from Contract RM000019RR2, October 1997 09/09/2002-refoamed in place	Refoamed in Place	September 9, 2002
T760B	Carpool/Bus Stop Facility, aka 760B	Yes	September 19, 2002
125	Standards Lab	Yes	September 20, 2002
280	Landfill Support Facility	Yes	September 26, 2002

Item ID	Description	Status	Date
888A	Electrical Transformer, 1500kva, 3ph (XFRMR will temporarily be re-used)	Relocated	October 01, 2002
282	Sanitary Landfill Fire Protection Building and 120,000 Gallon Water Tank (Part of B280 Facility)	Yes	October 10, 2002
284	Sanitary Landfill Leachate Collection and Storage Tank Farm (Tanks 505, 506, 507-aka D284A, D284B, D284C (west to east))	Yes	October 10, 2002
Tank 237	Propane Storage Tank, (west of T760A), NDT 1544	Returned to Vendor	October 10, 2002
Tank 259	Propane Storage Tank, NDT 1550 (904P Tank Farm)	Returned to Vendor	October 10, 2002
Tent 07	Mixed Waste Storage -902 Pad RCRA Unit 15	Yes	October 14, 2002
666	Storage Facility	Yes	October 16, 2002
Tank 256	Propane Storage Tank (904P Tank Farm)	Returned to Vendor	October 18, 2002
Tank 257	Propane Storage Tank (904P Tank Farm)	Returned to Vendor	October 18, 2002
TK-66	Storage Tank (#2 Diesel) (replacement for UST 66/Tank 002) (SE of 881)	Returned to Vendor	October 22, 2002
900ATM	CCFCU Automated Teller Machine (not DOE property)	Returned to Vendor	October 23, 2002
993	Security Storage Vault (WSI)	Yes	October 24, 2002
335	Fire Training Building	Yes	October 28, 2002
987	Storage Vault (WSI Plant Protection) Bunker (vacant)	Yes	October 28, 2002
331A	Fire Station Training (Behind 335)	Yes	July 20, 2001
902 Pad	Tent 07 Pad	Yes	November 1, 2002
904P	Propane Tank Farm (Tanks 145-148, 254-261)		November 1, 2002
308B-A	Modular Storage Tank, west tank, aka Tank 341 (NDT 1423)	Yes	November 19, 2002
308B-B	Modular Storage Tank, middle tank, aka Tank 343 (NDT 1422)	Yes	November 19, 2002
308B-C	Modular Storage Tank, east tank, aka Tank 344 (NDT 1421)	Yes	November 19, 2002
Tank 024	Propane Storage Tank, (west of 865) NDT 1558 (last known- 130 Yard)	Yes	November 26, 2002
Tank 037	Propane Storage Tank (out of service) orig west of 663 (last known- 130 Yard)	Yes	November 26, 2002
S452	Storage (west of 452)	Yes	December 3, 2002
207A	Solar Evaporator Pond OU-4	Yes	December 5, 2002
207B-C	Central Solar Evaporator Ponds OU-4	Yes	December 5, 2002
207B-N	North Solar Evaporator Ponds OU-4	Yes	December 5, 2002
207B-S	South Solar Evaporator Ponds OU-4	Yes	December 5, 2002
207C	Solar Evaporator Ponds OU-4	Yes	December 5, 2002
788 Clarifier Pad	788 Concrete Clarifier Pad	Yes	December 5, 2002
335 Pad	335 & 331A Pad	Yes	December 11, 2002
T334D	Trailer (Offices)	Sold	December 13, 2002
367	Pesticide Storage (was ID 667, located SE corner of 690 yard)	Yes	December 18, 2002
T334B	Trailer (Offices)	Yes	December 23, 2002
Tent 08	Mixed Waste Storage -904 Pad RCRA Unit 15	Yes	December 23, 2002
Tent 09	Mixed Waste Storage -904 Pad RCRA Unit 15	Yes	December 23, 2002
227	Nitric Acid Tank Concrete Cell/Pad (B910 - Tank 144)	Yes	December 24, 2002
228A	Drying Bed (910)	Yes	December 24, 2002
228B	Drying Bed (910)	Yes	December 24, 2002
T760A	Trailer - Lockers/Showers - Pondcrete	Yes	December 24, 2002
910	Solar Pond Evaporator Building, Gas Generators 1, 2, 3	Yes	December 24, 2002
Tank 143	Storage Tank 450-05A (southeast of 910)	Yes	December 24, 2002
Tank 144	Storage Tank D-15 (UST concrete), NaCl Brine Tank - 3800 Gal B910 (Reverse Osmosis Underground Concrete Tank - not	Yes	December 24, 2002

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	in use), there are no UST notifications that support the location/existence of this UST, east of 910 aka ID 226		
Tank 335	Nitric Acid Storage Tank, aka D-54, NDT 1198 (east of 910, within 227)	Sold	December 24, 2002
Tank 336	EDTA Storage Tank, aka D-51, NDT 1523 (north of B910)	Yes	December 24, 2002
884	Warehouse - Low Level Waste RCRA Unit 13	Yes	December 30, 2002
T904A	KHC Mobile Break Room Trailer	Relocated	January 06, 2003
T121A	Trailer (Offices - Technical Security)	Yes	January 09, 2003
Tank 170	Liquid Nitrogen Storage Tank, NDT 0008, (north of 374)	Returned to Vendor	January 09, 2003
Tank 106	Liquid Argon, NDT 1484 (northwest corner of 334)	Returned to Vendor	January 11, 2003
281	Sanitary Landfill Leachate Valve Building (Part of B280 Facility)	Yes	January 20, 2003
S281	Sanitary Landfill Bale Storage (Part of B280 Facility)	Yes	January 20, 2003
T441A	Trailer (Offices)	Yes	January 22, 2003
429	Process Waste Pit & Tank (B441 UST 36) aka Tank 077 (foamed in place)	Yes	January 22, 2003
992	Guard Post	Yes	January 23, 2003
885	Oil & Paint Storage	Yes	January 27, 2003
968 Pad	968 Concrete Pad (facility D&D'd)	Yes	January 30, 2003
993 Pad	993 Concrete Pad (facility D&D'd)	Yes	January 30, 2003
Tank 064	Propane Storage Tank (southwest 444)	Returned to Vendor	January 30, 2003
Tank 262	#1 Decontamination Water Storage Tank (903B - RCRA Unit 18 01)	Yes	February 6, 2002
Tank 263	#2 Decontamination Water Storage Tank (903B - RCRA Unit 18 01)	Yes	February 6, 2002
Tank 264	#3 Decontamination Water Storage Tank (903B - RCRA Unit 18 01)	Yes	February 6, 2002
Tank 265	#4 Decontamination Water Storage Tank (903B - RCRA Unit 18 01)	Yes	February 6, 2002
Tank 266	#5 Decontamination Water Storage Tank (903B - RCRA Unit 18 01)	Yes	February 6, 2002
283	Sanitary Landfill Evaporation Pond (Part of B280 Facility)	Yes	February 7, 2002
Cell 1	Sanitary Landfill Cell 1(Support of B280 Complex)	Yes	February 7, 2002
453	Maintenance Storage	Yes	February 7, 2002
427	Emergency Generator Building (444)	Yes	February 10, 2002
427A	Diesel Storage Tank (aka Tank 068)	Yes	February 10, 2002
449	Oil and Paint Storage	Yes	February 10, 2002
S449	Maintenance Storage	Yes	February 10, 2002
449A	Maintenance Annex (northeast of 439)	Yes	February 10, 2002
449C	Maintenance Carpenter Shop (northeast of 439)	Yes	February 10, 2002
112	External Dosimetry	Yes	February 25, 2002
T886D	Modular Analytical Lab Eberline (Contractor owned)	Relocated	February 25, 2002
Tent 10	Mixed Waste Storage -904 Pad RCRA Unit 15	Yes	February 26, 2002
Tent 11	Mixed Waste Storage -904 Pad RCRA Unit 15	Yes	March 03, 2003
Tank DW6	B966 area, NDT 1567	Yes	March 13, 2003
Tank DW7	B966 area, NDT 1568	Yes	March 13, 2003
Tank DW8	B966 area, NDT 1569	Yes	March 13, 2003
Tank DW9	B966 area, NDT 1570	Yes	March 13, 2003
Tank DW10	B966 area, Tank 357, NDT 1571	Yes	March 13, 2003
966	Decontamination Pad	Yes	March 13, 2003
S966-1	Tuff Shed, 966 Decon Pad, directly next to Decon Pad (approx 8'x12')	Yes	March 13, 2003

Item ID	Description	Status	Date
S966-2	Tuff Shed, 966 Decon Pad, north of Decon Pad (approx 6'x6')	Yes	March 13, 2003
Tank 206	Carbon Tetrachloride Storage Tank D-2 north of 707, NDT 0624, emptied 11/21/95 -	Yes	March 14, 2003
441	Production Support Offices	Yes	March 31, 2003
827	Generator removed - structure/slab still here - Slab Removed 4/2/03	Yes	April 02, 2003
C865	Cooling Tower (865)	Yes	April 02, 2003
T131A	Trailer (Offices)	Yes	April 14, 2003
863	Electrical Transformer - Switchgear	Yes	April 17, 2003
716	Emergency Generator #2 B771/774	Sold	April 18, 2003
207	Untreated Waste Storage Tank, NDT 1184, RCRA Unit 40, aka Tank 207 (NE of 777)	Yes	May 08, 2003
519	Alarms System Storage (steel framed, composite siding/roof, NW of 566)	Yes	May 21, 2003
553	Welding Shop & Offices	Yes	May 21, 2003
554	Warehouse Storage & Shipping Dock	Yes	May 21, 2003
556	Plasma Arc Training	Yes	June 03, 2003
428	Waste Collection Pump House Low Level - Unit 40	Yes	June 13, 2003
790	Radiation Calibration Labs	Yes	June 30, 2003
334	General Offices & Maintenance Shop	Yes	July 11, 2003
881C	Cooling Tower B881 - 900 Tons	Yes	July 15, 2003
830	Storage / Isolated Power Supply	Yes	July 15, 2003
308B	Modular Storage Tank Pump House	Yes	July 31, 2003
308D	Central Sump Pump House (Quonset Hut-southeast of Modular Tanks)	Yes	July 31, 2003
551	General Warehouse and Empty Waste Containers	Yes	August 08, 2003
372A	Personnel Access Control 371 (PACS 2)	Yes	August 19, 2003
372	Guard Post (Portal 2)	Yes	August 20, 2003
865	Materials and Process Development Lab	Yes	August 27, 2003
867	Filter Plenum (west of B865) Zone 1	Yes	August 27, 2003
868	Filter Plenum (east of B865) Zone 2	Yes	August 27, 2003
T771H	Trailer Offices	Yes	August 3, 2003
T771E	Trailer Offices	Yes	September 4, 2003

Appendix 1

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
NORTH EAST BUFFER ZONE							
110	BZ	NE-110	Trench T-3	HRR ¹	Annual 1996 ² Annual 1997 ³ Annual 2000 ²⁶ Annual 2002 ³⁵	Annual 1997 ³ Annual 2000 ²⁶	2002 ³²
111 1	BZ	NE-111 1	Trench T-4	HRR ¹	Annual 1996 ² Annual 1997 ³ Annual 2003 ⁴²	Annual 1997 ³	1999 ²⁷ 2003 ⁴²
111 2	BZ	NE-111 2	Trench T-5	HRR ¹	-	-	-
111 3	BZ	NE-111 3	Trench T-6	HRR ¹	-	-	-
111 4	BZ	NE-111 4	Trench T-7	HRR ¹	Annual 2003 ⁴²	-	2003 ⁴²
111 5	BZ	NE-111 5	Trench T-8	HRR ¹	-	-	-
111 6	BZ	NE-111 6	Trench T-9	HRR ¹	-	-	-
111 7	BZ	NE-111 7	Trench T-10	HRR ¹	-	-	-
111 8	BZ	NE-111 8	Trench T-11	HRR ¹	-	-	-
142 1	6	NE-142 1	Pond A-1	HRR ¹	Annual 1997 ³	Annual 1997 ³	-
142 2	6	NE-142 2	Pond A-2	HRR ¹	Annual 1997 ³	Annual 1997 ³	-
142 3	6	NE-142 3	Pond A-3	HRR ¹	Annual 1997 ³	Annual 1997 ³	-
142 4	6	NE-142 4	Pond A-4	HRR ¹	Annual 1997 ³	Annual 1997 ³	-
142 5	6	NE-142 5	Pond B-1	HRR ¹	Annual 1997 ³	Annual 1997 ³	-
142 6	6	NE-142 6	Pond B-2	HRR ¹	Annual 1997 ³	Annual 1997 ³	-
142 7	6	NE-142 7	Pond B-3	HRR ¹	Annual 1997 ³	Annual 1997 ³	-
142 8	6	NE-142 8	Pond B-4	HRR ¹	Annual 1997 ³	Annual 1997 ³	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
142 9	6	NE-142 9	Pond B-5	HRR ¹	Annual 1997 ³	Annual 1997 ³	-
142 12	6	NE-142 12	Flume Pond (IAG Name Newly Identified Pond A-5) (off-scale of Plate #1)	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
156 2	6	NE-156 2	Soil Dump Area Between the A and B Series Drainages	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷
166 1	6	NE-166 1	Trench A	HRR ¹	Annual 1996 ²	Annual 1996 ²	2002 ³²
166 2	6	NE-166 2	Trench B	HRR ¹	Annual 1996 ²	Annual 1996 ²	2002 ³²
166 3	6	NE-166 3	Trench C (two areas designated on Plate #2)	HRR ¹	Annual 1996 ²	Annual 1996 ²	2002 ³²
167 1	6	NE-167 1	Landfill North Area Spray Field	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷
167 2	7	NE-167 2	Pond Area Spray Field (Center Area)	HRR ¹	Annual 1996 ²	Annual 1996 ²	2002 ³²
167 3	7	NE-167 3	South Area Spray Field	HRR ¹	Annual 1996 ²	Annual 1996 ²	2002 ³²
216 1	6	NE-216 1	East Spray Fields - North Area	HRR ¹	Annual 1996 ²	Annual 1996 ²	2002 ³²
216 2	BZ	NE-216 2	East Spray Field	HRR ¹	Annual 1997 ³ Annual 2003	Annual 1997 ³	-
216 3	BZ	NE-216 3	East Spray Field	HRR ¹	Annual 1997 ³ Annual 2003	Annual 1997 ³	-
NA	BZ	NE-1400	Tear Gas Powder Release	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	BZ	NE-1401	NE Buffer Zone Gas Line Break	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	BZ	NE-1402	East Inner Gate PCB Spill	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
NA	BZ	NE-1403	Gasoline Spill - Building 920 Guard Post	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
142 6	BZ	NE-1404	Diesel Spill at Pond B-2 Spillway	Quarterly 2 ⁵	Quarterly 3 ⁶ Annual 1998 ⁷	Annual 1998 ⁷	2002 ³⁴
NA	BZ	NE-1405	Diesel Fuel Spill at Field Treatability Unit (identified as NE-1404, reassigned NE-1405 in Quarterly 7 ⁹)	Quarterly 3 ⁶	Quarterly 4 ⁸ Quarterly 7 ⁹ Annual 1998 ⁷	Annual 1998 ⁷	1999 ²⁸
NA	BZ	NE-1406	771 Hillside Sludge Release	Quarterly 4 ⁸	Annual 1998 ⁷	Annual 1998 ⁷	1999 ²⁸
NA	BZ	NE-1407	OU 2 Treatment Facility	Quarterly 4 ⁸	Quarterly 7 ⁹ (900-1312) Quarterly 8 ¹⁵ (900-1309) Annual 2003	Annual 2002	-
NA	BZ	NE-1408	OU 2 Test Well (formerly NE-1406)	Quarterly 4 ⁸	Quarterly 7 ⁹	Annual 1999 ²³	2000 ²⁹
NA	BZ	NE-1409	Modular Tanks and 910 Treatment System Spill (formerly 000-503)	Quarterly 5 ¹⁰	Quarterly 7 ⁹ Annual 2000 ²⁶	Annual 1999 ²³ Annual 2000 ²⁶	2001 ³¹ 2002 ³²
NA	BZ	NE-1410	Diesel Fuel Spill at Field Treatability Unit	Quarterly 7 ⁹	-	Quarterly 7 ⁹	2002 ³⁴
NA	BZ	NE-1411	Diesel Fuel Overflowed from Tanker at OU 2 Field Treatability Unit	Quarterly 7 ⁹	-	Quarterly 7 ⁹	2002 ³⁴
NA	BZ	NE-1412	Trench T-12 Located in OU 2 East Trenches	Quarterly 10 ¹¹	Annual 2003		-
NA	BZ	NE-1413	Trench T-13 Located in OU 2 East Trenches	Quarterly 10 ¹¹	Annual 2003		-

Appendix 1. HRR Sites at RFETS

NORTHWEST RUBBER ZONE						
IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR
						NFA Recommendation Approved
114	7	NW-114	Present Landfill	HRR ¹	-	-
170	BZ	NW-170	PU&D Storage Yard - Waste Spills	HRR ¹	Annual 1997 ³ Annual 1998 ⁷ Annual 2002 ³⁵	Annual 1998 ⁷ Annual 1999 ²³
174A	BZ	NW-174A	PU&D Yard Container Storage Area	HRR ¹	Annual 1997 ³ Annual 1998 ⁷ Annual 2003	-
174B	BZ	NW-174B	PU&D Container Storage Facilities	HRR ¹	Annual 1997 ³ Annual 1998 ⁷	Annual 1998 ⁷ Annual 1999 ²³
195	16	NW-195	Nickel Carbonyl Disposal	HRR ¹	Annual 1996 ²	OU 16 CAD/ROD ¹²
203	7	NW-203	Inactive Hazardous Waste Storage Area	HRR ¹	Annual 1996 ² Annual 1998 ⁷	Annual 1998 ⁷ 1999 ²⁸
NA	BZ	NW-1500	Diesel Spill at PU&D Yard (formerly NW-175)	Quarterly 3 ⁶	Quarterly 7 ⁹ Annual 1998 ⁷	Annual 1998 ⁷ 1999 ²⁸
NA	BZ	NW-1501	Asbestos Release at PU&D Yard (formerly NW-176)	Quarterly 3 ⁶	Quarterly 7 ⁹	Annual 1999 ²³ 2000 ²⁹
114	7	NW-1502	Improper Disposal of Diesel-Contaminated Material at Landfill (formerly NW-177)	Quarterly 2 ⁵	Quarterly 3 ⁶ Quarterly 7 ⁹	Quarterly 7 ⁹ 2002 ³²
114	7	NW-1503	Improper Disposal of Fuel-Contaminated Material at Landfill	Quarterly 1 ²⁴	Quarterly 7 ⁹	Quarterly 7 ⁹ 2002 ³²
114	7	NW-1504	Improper Disposal of Thoroslane-Contaminated Material at Landfill	Quarterly 7 ⁹	-	Quarterly 7 ⁹ 2002 ³⁴
NA	BZ	NW-1505	North Firing Range	Annual 2001	Annual 2001	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
SOUTHEAST BUFFER ZONE							
142 10	5	SE-142 10	Pond C-1	HRR ¹	Annual 1997 ³	Annual 1997 ³	-
142 11	5	SE-142 11	Pond C-2	HRR ¹	Annual 1997 ³	Annual 1997 ³	-
209	5	SE-209	Surface Disturbance Southeast of Bldg 881	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷
NA	BZ	SE-1600	Pond 7-Steam Condensate Releases	HRR ¹	Annual 2002 ³⁵	-	EPA, 1992 ⁴ , 2002 ³⁴
NA	BZ	SE-1601	Pond 8 - Cooling Tower Discharge Releases	HRR ¹	Annual 2002 ³⁵	-	EPA, 1992 ⁴ , 2002 ³⁴
155	BZ	SE-1602	East Firing Range	Annual 1999 ²³	-	-	-
SOUTHWEST BUFFER ZONE							
115	1A	SW-115	Original Landfill	HRR ¹	-	-	-
133 1	5	SW-133 1	Ash Pit 1	HRR ¹	Annual 2001 Annual 2003 ⁴²	Annual 2001	2003 ⁴²
133 2	5	SW-133 2	Ash Pit 2	HRR ¹	Annual 2001 Annual 2002 ³ Annual 2003 ⁴²	Annual 2001	2003 ⁴²
133 3	5	SW-133 3	Ash Pit 3	HRR ¹	Annual 2001	Annual 2001	2002 ³²
133 4	5	SW-133 4	Ash Pit 4	HRR ¹	Annual 2001 Annual 2002 ³⁵ Annual 2003 ⁴²	Annual 2001	2003 ⁴²
133 5	5	SW-133 5	Incinerator Facility	HRR ¹	Annual 1997 ³ Annual 2001	Annual 1997 ³ Annual 2001	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
133 6	5	SW-133 6	Concrete Wash Pad	HRR ¹	Annual 1997 ³ Annual 2001	Annual 1997 ³ Annual 2001	-
196	IA	SW-196	Water Treatment Plant Backwash Pond	HRR ¹	-	-	-
NA	BZ	SW-1700	Fuel Spill into Woman Creek Drainage	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	5	SW-1701	Recently Identified Ash Pit (also referred to as TDEM-1)	Quarterly 9 ¹³	Annual 1997 ³ Annual 2001	Annual 1997 ³ Annual 2001	2002 ³²
NA	5	SW-1702	Recently Identified Ash Pit (also referred to as TDEM-2)	Quarterly 9 ¹³	Annual 2001 Annual 2003 ⁴²	Annual 2001	2003 ⁴²
000 AREA							
101	IA	000-101	207 Solar Evaporation Ponds	HRR ¹	Annual 1998 ⁷ Annual 2003		2003 ³⁰
121	IA	000-121	Original Process Waste Lines (includes Tanks T-2, T-3, T-10, T-14, T-16, T-40)	HRR ¹	Annual 1996 ² Annual 1998 ⁷ (UBC 123)	Annual 2002 (Tank 40 only)	-
162	IA	000-162	Radioactive Site - 700 Area Site # 2	HRR ¹	-	-	-
168	11	000-168	West Spray Field	HRR ¹	Annual 1996 ²	-	OU 11 CAD/ROD ¹⁴
172	IA	000-172	Central Avenue Waste Spill	HRR ¹	Annual 1998 ⁷	Annual 1998 ⁷	1999 ²⁸
190	IA	000-190	Caustic Leak (also referred to as Central Avenue Ditch)	HRR ¹	-	-	-
192	16	000-192	Antifreeze Discharge	HRR ¹	Annual 1996 ²	-	OU 16 CAD/ROD ¹²
NA	IA	000-500	Sanitary Sewer System (not shown on Plate 4)	HRR ¹	-	-	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
NA	BZ	000-501	Roadway Spraying	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	000-502 (see 900-1310)	ITS Water Spill (identified in Quarterly 2 as 000-502, reassigned as 900-1310 in Quarterly 7, the number 000-502 is no longer in use)	Quarterly 2 ⁵	NA	NA	NA
NA	IA	000-503	Solar Pond Water Spill Along Central Avenue	Quarterly 7 ⁹	-	Quarterly 7 ⁹	2002 ³⁴
NA	IA	000-504	New Process Waste Lines	Annual 1999 ²³	-	-	-
NA	IA	000-505	Storm Drains	Annual 1999 ²³	-	-	-
100 AREA							
148	IA	100-148	Waste Spills	HRR ¹	Annual 1998 ⁷ (UBC 123) Annual 2003 ³⁹	Annual 2002	2003 ³⁹
NA	IA	100-600	Mercury Spill-Valve Vault 124-B, Building 124	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	100-601	Building 123 Phosphoric Acid Spill	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	100-602	Building 123 Process Waste Line Break	HRR ¹	-	-	-
NA	IA	100-603	Building 123 Bioassay Waste Spill	HRR ¹	Annual 2001 Annual 2002 ³⁶	Annual 2001	2002 ³²
NA	IA	100-604	T130 Complex Sewer Line Leaks	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
NA	IA	100-605	Building 115 Hydraulic Oil Spill	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	100-606	Building 125 TCE Spill	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	100-607	Building 111 Transformer PCB Leak	HRR ¹	Annual 2000 ²⁶ Annual 2001 Annual 2002 ³⁶	Annual 2001	2001 ³⁰
NA	IA	100-608	Building 131 Transformer Leak	HRR ¹	Annual 1998 ⁷	Annual 1998 ⁷	1999 ²⁸
NA	IA	100-609	Building 121 Security Incinerator	HRR ¹	Annual 2003 ³⁹	Annual 2002	Annual 2003 ³⁹
NA	IA	100-610	Asbestos Release - Building 123	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	100-611	Building 123 Scrubber Solution Spill	HRR ¹	Annual 2003 ³⁹	Annual 2002	2003 ³⁹
NA	IA	100-612	Battery Solution Spill - Building 119	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	100-613	Asphalt Surface in Lay-down Yard North of Building 130 (identified as 000-501 in Quarterly 4 ⁸ , reassigned as 100-613 in Quarterly 7 ⁹)	Quarterly 4 ⁸	Quarterly 7 ⁹ Annual 2002 ³⁵	Quarterly 7 ⁹	2002 ³⁴
Off-Air Data							
128	IA	300-128	Oil Burn Pit No 1	HRR ¹	Annual 2003 ⁴⁴	-	2003 ⁴⁴
134N	IA	300-134N	Lithium Metal Destruction Site	HRR ¹	Annual 2003 ⁴⁴	-	2003 ⁴⁴
134S	IA	300-134S	Lithium Metal Destruction Site	HRR ¹	-	-	-
135	IA	300-135	Cooling Tower Blowdown	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷
151	IA	300-151	Tank 262 Fuel Oil Spills	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
156 1	IA	300-156 1	Building 371 Parking Lot (two locations designated on Plate #2)	HRR ¹	Annual 1997 ³ Annual 2000 ²⁶	Annual 1997 ³ Annual 2000 ²⁶	2001 ³¹ 2002 ³²
171	IA	300-171	Solvent Burning Ground	HRR ¹	Annual 2003 ⁴⁴	-	2003 ⁴⁴
181	IA	300-181	Building 334 Cargo Container Area	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷
186	IA	300-186	Valve Vault 12	HRR ¹	-	-	-
188	IA	300-188	Acid Leak	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷
206	IA	300-206	Inactive D-836 Hazardous Waste Tank	HRR ¹	Annual 2001	Annual 2001	2002 ³⁴
212	IA	300-212	Building 371 Drum Storage Area, Unit 63 (deferred to Part VIII of the RFETS RCRA Mixed Residues Modification, see Annual 1997)	HRR ¹	Annual 1997 ³	Annual 1997 ³	2002 ³⁴
NA	IA	300-700	Scrap Roofing Disposal (see also BZCR Site 31, Section 3)	HRR ¹	-	-	EPA, 1992 ⁴ , 2002 ³²
NA	IA	300-701	Sulfuric Acid Spill - Building 371	HRR ¹	-	-	EPA, 1992 ⁴ , 2002 ³²
NA	IA	300-702	Pesticide Shed	HRR ¹	Annual 2003 ⁴²	-	2003 ⁴⁸
NA	IA	300-703	Building 331 North Area	HRR ¹	-	-	EPA, 1992 ⁴ , 2002 ³²
NA	IA	300-704	Roof Fire, Building 381	HRR ¹	-	-	EPA, 1992 ⁴ , 2002 ³²
NA	IA	300-705	Potassium Hydroxide Spill North of Building 374	HRR ¹	-	-	EPA, 1992 ⁴ , 2002 ³²
NA	IA	300-706	Evaporator Tanks North of Building 374	HRR ¹	-	-	EPA, 1992 ⁴ , 2002 ³²

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
NA	IA	300-707	Sanitizer Spill	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	300-708	Transformers North of Building 371	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	300-709	Transformer Leak 334-1	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	300-710	Gasoline Spill North of Building 331	HRR ¹	-	-	EPA, 1992 ⁴ , 2002 ³²
NA	IA	300-711	Nickel-Cadmium Battery Acid Spill Outside of Building 373	Quarterly 1 ²⁴	Quarterly 7 ⁹	Quarterly 7 ⁹	2002 ³⁴
NA	IA	300-712	0 5-Gallon Antifreeze Spilled by Street Sweeper Outside of Building 373	Quarterly 7 ⁹	-	Quarterly 7 ⁹	2002 ³⁴
NA	IA	300-713	Caustic Spill North of Building 331	Quarterly 8 ¹⁵	-	Quarterly 8 ¹⁵	2002 ³⁴
NA	IA	300-714	Laundry Waste Water Spill from Tank T-803, North of Building 374	Quarterly 10 ¹¹	-	Quarterly 10 ¹¹	2002 ³⁴
NA	IA	300-715	Battery Acid Spill	Annual 1997 ³	-	Annual 1997 ³	1999 ²⁷
400 AREA							
116 1	IA	400-116 1	West Loading Dock, Building 447 (IAG Name West Loading Dock Area)	HRR ¹	-	-	-
116 2	IA	400-116 2	South Loading Dock, Building 444 (IAG Name South Loading Dock Area)	HRR ¹	-	-	-
122	IA	400-122	Underground Concrete Tank	HRR ¹	Annual 1996 ² (000-121)	-	-
129	IA	400-129	Building 443 Oil Leak (deferred to IA OU, see Annual 1997)	HRR ¹	Annual 1996 ² Annual 1997 ³	-	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
136 1	IA	400-136 1	Cooling Tower Pond West of Building 444 (IAG Name Cooling Tower Pond Northeast Corner of Building 460)	HRR ¹	-	-	-
136 2	IA	400-136 2	Cooling Tower Pond East of Building 444 (IAG Name Cooling Tower Pond West of Building 460)	HRR ¹	-	-	-
157 1	IA	400-157 1	Radioactive Site North Area	HRR ¹	-	-	-
157 2	IA	400-157 2	Radioactive Site South Area	HRR ¹	-	-	-
182	IA	400-182	Building 444/453 Drum Storage Area	HRR ¹	-	-	-
187	IA	400-187	Sulfuric Acid Spill (IAG Name Acid Leaks [2])	HRR ¹	-	-	-
191	IA	400-191	Hydrogen Peroxide Spill	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷
193	16	400-193	Steam Condensate Leak	HRR ¹	Annual 1996 ²	-	OU 16 CAD/ROD ¹²
204	15	400-204	Original Uranium Chip Roaster (deferred to D&D and UBC 447, see OU 15 CAD/ROD)	HRR ¹	Annual 1996 ²	Annual 1996 ²	2002 ³²
205	IA	400-205	Building 460 Sump #3 Acid Side	HRR ¹	-	-	-
207	IA	400-207	Inactive 444 Acid Dumpster	HRR ¹	-	-	-
208	IA	400-208	Inactive 444/447 Waste Storage Area	HRR ¹	-	-	-
NA	IA	400-800	Transformer 443-1	HRR ¹	Annual 1998 ⁷	Annual 1998 ⁷	1999 ²⁸
NA	IA	400-801	Transformer, Roof of Building 447	HRR ¹	-	-	-
NA	IA	400-802	Storage Area, South of Building 334	HRR ¹	Annual 2003 ⁴³	-	2003 ⁴³
NA	IA	400-803	Miscellaneous Dumping, Building 460 Storm Drain	HRR ¹	-	-	-
NA	IA	400-804	Road North of Building 460	HRR ¹	-	-	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
NA	IA	400-805	Building 443 Tank #9 Leak	HRR ¹	Annual 2002 ³⁵	-	EPA, 1992 ⁴ , 2002 ³²
NA	IA	400-806	Catalyst Spill, Building 440	HRR ¹	-	-	EPA, 1992 ⁴ , 2002 ³²
NA	IA	400-807	Sandblasting Area	HRR ¹	Annual 2003 ⁴⁶	-	2003 ⁴⁶
NA	IA	400-808	Vacuum Pump Leak - Building 442	HRR ¹	-	-	EPA, 1992 ⁴ , 2002 ³²
NA	IA	400-809	Oil Leak - 446 Guard Post	HRR ¹	-	-	EPA, 1992 ⁴ , 2002 ³²
NA	IA	400-810	Beryllium Fire - Building 444	HRR ¹	-	-	-
NA	IA	400-811	Transformer 443-2, Building 443	Quarterly 2 ⁵	Quarterly 3 ⁶ Annual 1998 ⁷	Annual 1998 ⁷	1999 ²⁸
NA	IA	400-812	Tank T-2 Spill in Building 460	Quarterly 6 ¹⁶	Quarterly 7 ⁹ Quarterly 8 ¹⁵ Annual 2001	Quarterly 8 ¹⁵ Annual 2001	2002 ³²
NA	IA	400-813	RCRA Tank Leak in Building 460	Quarterly 7 ⁹	-	-	-
NA	IA	400-814	Air Conditioner Compressor Release, Bldg 444 Roof	Quarterly 8 ¹⁵	-	Quarterly 8 ¹⁵	2002 ³⁴
NA	IA	400-815	RCRA Tank Leak in Building 460	Quarterly 8 ¹⁵	-	-	-
NA	IA	400-820 (see 600-1004)	Central Avenue Ditch Soil Spreading (identified in Quarterly 6 as 400-820, reassigned as 600-1004 in Quarterly 7, the number 400-820 is no longer in use)	Quarterly 6 ¹⁶	Quarterly 7 ⁹	NA	NA

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
500 AREA							
117 1	IA	500-117 1	North Site Chemical Storage	HRR ¹	-	-	-
117 2	IA	500-117 2	Middle Site Chemical Storage	HRR ¹	-	-	-
158	IA	500-158	Radioactive Site - Building 551	HRR ¹	-	-	-
159	IA	500-159	Radioactive Site - Building 559	HRR ¹	-	-	-
169	IA	500-169	Waste Drum Peroxide Burial	HRR ¹	Annual 1998 ⁷ Annual 2000 ²⁶	Annual 1998 ⁷	-
197	IA	500-197	Scrap Metal Sites	HRR ¹	-	-	-
NA	IA	500-900	Transformer Leak - 515/516	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	500-901	Transformer Leak - 555	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	500-902	Transformer Leak - 559	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	500-903	RCRA Storage Unit #1	HRR ¹	-	-	EPA, 1992 ⁴ , 2002 ³²
NA	IA	500-904	Transformer Leak - 223-1/223-2	HRR ¹	-	-	-
NA	IA	500-905	Transformer Leak - 558-1	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	500-906	Asphalt Surface Near Building 559	Quarterly 4 ⁸	Annual 2003 ⁴⁷	Annual 2002	2003 ⁴⁷
172	IA	500-907	Tanker Truck Release of Hazardous Waste from Tank 231B	Quarterly 9 ¹³	Annual 2003 ⁴¹		2003 ⁴¹
156 1, 186	IA	500-908	Oil Released from Air Compressor	Quarterly 12 ¹⁷	-	Quarterly 12 ¹⁷	2002 ³⁴
158	IA	500-909	Release of Spent Photographic Fixer Solution	Annual 1996 ²	-	Annual 1996 ²	2002 ³²
600 AREA							
117 3	IA	600-117 3	Chemical Storage - South Site	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
120 1	IA	600-120 1	Fiberglassing Area North of Building 664	HRR ¹		-	-
120 2	IA	600-120 2	Fiberglassing Area West of Building 664	HRR ¹	Annual 2003 ⁴⁶	-	2003 ⁴⁶
152	IA	600-152	Fuel Oil Tank 221 Spills	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷
160	IA	600-160	Radioactive Site Building 444 Parking Lot	HRR ¹	-	-	-
161	IA	600-161	Radioactive Site - Building 664	HRR ¹	Annual 2003 ⁴⁶	-	2003 ⁴⁶
164 1	IA	600-164 1	Radioactive Slab from Bldg 771	HRR ¹	Annual 1997 ³ Annual 2000 ²⁶ Annual 2002 ³⁶	Annual 1997 ³ Annual 2000 ²⁶	2001 ³¹ 2002 ³²
189	IA	600-189	Nitric Acid Tank	HRR ¹	Annual 1997 ³ Annual 2000 ²⁶ Annual 2001	Annual 1997 ³ Annual 2001	2002 ³⁴
NA	IA	600-1000	Transformer Storage Building 662	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	600-1001	Temporary Waste Storage Building 663	HRR ¹	Annual 1997 ³ Annual 2003 ⁴⁵	-	2003 ⁴⁵
NA	IA	600-1001(a)	Waste Oil Identified in PAC-1001	Annual 1997 ³	Annual 1997 ³ Annual 2000 ^{26a} Annual 2002 ³⁶	Annual 1997 ³	1999 ²⁷ 2002 ³²
NA	IA	600-1002	Transformer Storage - West of Building 666	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	600-1003	Transformers North and South of 661-675 Substation	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
152, 157 1, 172	IA	600-1004	Central Avenue Ditch Cleaning Incident (formerly identified as 400-820)	Quarterly 6 ¹⁶	Quarterly 7 ⁹	-	-
NA	IA	600-1005	Former Pesticide Storage Area	Quarterly 7 ⁹	Annual 2003 ⁴⁰	Annual 2002	2003 ⁴⁰

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
700 AREA							
118 1	IA	700-118 1	Multiple Solvent Spills West of Building 730	HRR ¹	Annual 1998 ⁷	-	-
118 2	IA	700-118 2	Multiple Solvent Spills South End of Building 776	HRR ¹	-	-	-
123 1	IA	700-123 1	Valve Vault 7	HRR ¹	Annual 1997 ³ Annual 2000 ²⁶	Annual 1997 ³ Annual 2000 ²⁶	2001 ³¹ 2002 ³²
123 2	IA	700-123 2	Valve Vault West of Building 707	HRR ¹	-	-	-
124 1	IA	700-124 1	30,000 Gallon Tank (Tank #68)	HRR ¹	Annual 1996 ² (000-121)	-	-
124 2	IA	700-124 2	14,000 Gallon Tank (Tank #66)	HRR ¹	Annual 1996 ² (000-121)	-	-
124 3	IA	700-124 3	14,000 Gallon Tank (Tank #67)	HRR ¹	Annual 1996 ² (000-121)	-	-
125	IA	700-125	Holding Tank (Tank #66)	HRR ¹	-	-	-
126 1	IA	700-126 1	Westernmost Out-of-Service Waste Tank	HRR ¹	-	-	-
126 2	IA	700-126 2	Easternmost Out-of-Service Waste Tank	HRR ¹	-	-	-
127	IA	700-127	Low-Level Radioactive Waste Leak	HRR ¹	-	-	-
131	IA	700-131	Radioactive Site - 700 Area Site #1	HRR ¹	-	-	-
132	IA	700-132	Radioactive Site - 700 Area Site #4	HRR ¹	Annual 1996 ² (000-121) Annual 1997 ³	-	-
137	IA	700-137	Cooling Tower Blowdown Buildings 712 and 713 (IAG Name Cooling Tower Blowdown Building 774)	HRR ¹	-	-	-
138	IA	700-138	Cooling Tower Blowdown Building 779	HRR ¹	-	-	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
139 1N(a)	IA	700-139 1N(a)	Caustic/Acid Spills Hydroxide Tank Area	HRR ¹	Annual 1999 ²³	-	-
139 1N(b)	IA	700-139 1N(b)	Caustic/Acid Spills Hydroxide Tank Area	HRR ¹			
139 1S	IA	700-139 1S	Caustic/Acid Spills Hydroxide Tank Area	HRR ¹			
139 2	IA	700-139 2	Caustic/Acid Spills Hydrofluoric Acid Tanks	HRR ¹	-	-	-
143	IA	700-143	Bldg 771 Outfall	HRR ¹	Annual 1997 ³	-	-
144	IA	700-144(N)	Sewer Line Overflow (IAG Name Sewer Line Break)	HRR ¹	-	-	-
144	IA	700-144(S)	Sewer Line Overflow (IAG Name Sewer Line Break)	HRR ¹	-	-	-
146 1	IA	700-146 1	Concrete Process Waste Tanks 7,500 Gallon Tank (31)	HRR ¹	-	-	-
146 2	IA	700-146 2	Concrete Process Waste Tanks 7,500 Gallon Tank (32)	HRR ¹	-	-	-
146 3	IA	700-146 3	Concrete Process Waste Tanks 7,500 Gallon Tank (34W)	HRR ¹	-	-	-
146 4	IA	700-146 4	Concrete Process Waste Tanks 7,500 Gallon Tank (34E)	HRR ¹	-	-	-
146 5	IA	700-146 5	Concrete Process Waste Tanks 3,750 Gallon Tank (30)	HRR ¹	-	-	-
146 6	IA	700-146 6	Concrete Process Waste Tanks 3,750 Gallon Tank (33)	HRR ¹	-	-	-
147 1	IA	700-147 1	Process Waste Line Leaks (IAG Name Maas Area)	HRR ¹	-	-	-
149 1	IA	700-149 1	Effluent Pipe	HRR ¹			
149 2	IA	700-149 2	Effluent Pipe	HRR ¹		-	

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Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
150 1	IA	700-150 1	Radioactive Site North of Building 771 (IAG Name Radioactive Leak North of Building 771)	HRR ¹	-	-	-
150 2	IA	700-150 2	Radioactive Site West of Buildings 771 and 776 (IAG Name Radioactive Leak West of Building 771)	HRR ¹	-	-	-
150 3	IA	700-150 3	Radioactive Site Between Buildings 771 & 774 (IAG Name Radioactive Leak Between Buildings 771 & 774)	HRR ¹	-	-	-
150 4	IA	700-150 4	Radioactive Site Northwest of Building 750 (IAG Name Radioactive Leak East of Building 750)	HRR ¹	-	-	-
150 5	IA	700-150 5	Radioactive Site West of Building 707 (IAG Name Radioactive Leak West of Building 707)	HRR ¹	Annual 1998 ⁷	Annual 1998 ⁷	1999 ³⁸
150 6	IA	700-150 6	Radioactive Site South of Building 779 (IAG Name Radioactive Leak South of Building 779)	HRR ¹	Annual 2003	-	-
150 7	IA	700-150 7	Radioactive Site South of Building 776 (IAG Name Radioactive Leak South of Building 776)	HRR ¹	-	-	-
150 8	IA	700-150 8	Radioactive Site Northeast of Building 779 (IAG Name Radioactive Leak Northeast of Building 779)	HRR ¹	Annual 2003	-	-
163 1	IA	700-163 1	Radioactive Site 700 Area Site No 3 Wash Area	HRR ¹	-	-	-
163 2	IA	700-163 2	Radioactive Site 700 Area Site No 3 Buried Slab	HRR ¹	-	-	-
185	16	700-185	Solvent Spill	HRR ¹	Annual 1996 ²	-	OU 16 CAD/ROD ¹²
194	16	700-194	Steam Condensate Leak	HRR ¹	Annual 1996 ²	-	OU 16 CAD/ROD ¹²
214	IA	700-214	750 Pad Pondcrete & Saltcrete Storage, Unit 25	HRR ¹	-	-	-
215	IA	700-215	Process Waste Tank Unit 55 13	HRR ¹	-	-	-
NA	IA	700-1100	French Drain North of Building 776/777	HRR ¹	-	-	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
NA	IA	700-1101	Laundry Tank Overflow - Building 732	HRR ¹	-	-	-
NA	IA	700-1102	Transformer Leak - 776-4	HRR ¹	Annual 1996 ² Annual 1997 ³ Annual 2000 ²⁶ Annual 2001	Annual 1997 ³ Annual 2001	-
NA	IA	700-1103	Leaking Transformers - Building 707	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	700-1104	Leaking Transformers - Building 708	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	700-1105	Transformer Leak - 779-1/779-2	HRR ¹	-	-	-
NA	IA	700-1106	Process Waste Spill - Portal 1	HRR ¹	Annual 2003 ³⁷	Annual 2002	2003 ³⁷
NA	IA	700-1107	Compressor Waste Oil Spill - Building 776	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	700-1108	771/774 Footing Drain Pond	HRR ¹	Annual 1999 ²³	-	-
NA	IA	700-1109	Uranium Incident - Building 778	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	700-1110	Nickel Carbonyl Burial West of Building 771	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³⁴
NA	IA	700-1111	Leaking Transformer - Building 750	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	700-1112	Leaking Transformer - 776-5	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
101	IA	700-1113	Water Released from 207C Solar Evaporation Pond	Quarterly 11 ¹⁸	-	Quarterly 11 ¹⁸	2002 ³⁴
NA	IA	700-1114a	Release During Liquid Transfer Operations from Bldg 774	Annual 1997 ³	-	Annual 1997 ³	2002 ³⁴
NA	IA	700-1114b	Release During Liquid Transfer Operations from Bldg 774	Annual 1997 ³	Annual 2002 ³⁵	Annual 1997 ³	2002 ³⁴

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
NA	IA	700-1115	Identification of Diesel Fuel in Subsurface Soils	Annual 1997 ³	-	-	-
150 7	IA	700-1116	Leaking Transformer South of Building 776	Annual 1998 ⁷	-	-	-
NA	IA	700-1117	Building 701 Water Line, Soil Put-back	Annual 1998 ⁷	-	Annual 1998 ⁷	CDPHE 1998 ¹⁹
800 AREA							
102	1	800-102	Oil Sludge Pit	HRR ¹	Annual 1997 ³	-	OU 1 CAD/ROD ²⁰
103	1	800-103	Chemical Burial	HRR ¹	Annual 1997 ³	-	OU 1 CAD/ROD ²⁰
104	1	800-104	Liquid Dumping	HRR ¹	Annual 1997 ³	-	OU 1 CAD/ROD ²⁰
105 1	1	800-105 1	Bldg 881 Westernmost Out of Service Fuel Tanks	HRR ¹	Annual 1997 ³	-	OU 1 CAD/ROD ²⁰
105 2	1	800-105 2	Bldg 881 Easternmost Out of Service Fuel Tanks	HRR ¹	Annual 1997 ³	-	OU 1 CAD/ROD ²⁰
106	1	800-106	Bldg 881, Outfall	HRR ¹	Annual 1997 ³	-	OU 1 CAD/ROD ²⁰
107	1	800-107	Bldg 881, Hillside Oil Leak	HRR ¹	Annual 1997 ³	-	OU 1 CAD/ROD ²⁰
145	1	800-145	Sanitary Waste Line Leak	HRR ¹	Annual 1997 ³	-	OU 1 CAD/ROD ²⁰
147 2	IA	800-147 2	Bldg Conversion Activity Contamination Area	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷
164 2	IA	800-164 2	Radioactive Site 800 Area Site #2, Building 886 Spills	HRR ¹	Annual 2003 ⁵²	-	2003 ⁵²
164 3	IA	800-164 3	Radioactive Site 800 Area Site #2, Building 889 Storage Pad	HRR ¹	Annual 2003 ³⁸	-	2003 ³⁸
177	IA	800-177	Building 885 Drum Storage and Paint Storage (IAG Name Building 885 Drum Storage Area)	HRR ¹	-	-	-
178	15	800-178	Building 881 Drum Storage Area	HRR ¹	Annual 1996 ²	-	OU 15 CAD/ROD ²¹

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
179	15	800-179	Building 865 Drum Storage, refer to OU 15 CAD/ROD)	HRR ¹	Annual 1996 ² Annual 2001	Annual 1996 ² Annual 2001	2002 ³²
180	15	800-180	Building 883 Drum Storage, refer to OU 15 CAD/ROD)	HRR ¹	Annual 1996 ² Annual 2001	Annual 1996 ² Annual 2001	2002 ³²
211	15	800-211	Building 881 Drum Storage, Unit 26	HRR ¹	Annual 1996 ²	-	OU 15 CAD/ROD ²²
217	15	800-217	Building 881, CN Bench Scale Treatment, Unit 32	HRR ¹	Annual 1996 ²	-	OU 15 CAD/ROD ²²
NA	IA	800-1200	Valve Vault 2	HRR ¹	-	-	-
NA	IA	800-1201	Radioactive Site South of Building 883	HRR ¹	-	-	-
NA	IA	800-1202	Sulfuric Acid Spill, Building 883	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	800-1203	Sanitary Sewer Line Break Between Buildings 865 and 886	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	800-1204	Building 866 Spills	HRR ¹	-	-	-
NA	IA	800-1205	Building 881, East Dock	HRR ¹	Annual 2003 ⁵³	-	2003 ⁵³
NA	IA	800-1206	Fire, Building 883	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	800-1207	Transformer 883-4	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	800-1208	Transformer 881-4	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	800-1209	Leaking Transformers, 800 Area	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	800-1210	Transformers 865-1 and 865-2	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	800-1211	Capacitor Leak, Building 883	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
NA	IA	800-1212	Building 866 Sump Spill	Quarterly 5 ¹⁰	-	-	-
900 AREA							
108	BZ	900-108	Trench T-1	HRR ¹	Annual 1997 ³ Annual 1998 ⁷ Annual 2000 ²⁶	Annual 1999 ²³ Annual 2000 ²⁶	2001 ³¹ 2002 ³²
109	BZ	900-109	Trench T-2 - Ryan's Pit	HRR ¹	Annual 1996 ² Annual 1997 ³ Annual 2002 ³⁵	Annual 1997 ³	2002 ³⁴
112	BZ	900-112	903 Pad (IAG Name 903 Drum Storage Area)	HRR ¹	Annual 1997 ³ Annual 1998 ⁷ Annual 1999 ²³ Annual 2000 ²⁶	-	-
113	BZ	900-113	Mound Area	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷
119 1	1	900-119 1	West Scrap Metal Storage Area and Solvent Spill (OU 1 CAD/ROD Specifies Continuance of Groundwater Collection from well (see ref # 20))	HRR ¹	Annual 1996 ² Annual 1997 ³ Annual 1998 ⁷	-	1999 ²⁷
119 2	1	900-119 2	East Scrap Metal Storage Area and Solvent Spill	HRR ¹	Annual 1996 ² Annual 1997 ³	-	OU 1 CAD/ROD ²⁰
130	1	900-130	Contaminated Soil Disposal Area East of Bldg 881	HRR ¹	Annual 1997 ³	-	OU 1 CAD/ROD ²⁰

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA- Recommendation Approved
140	BZ	900-140	Hazardous Disposal Area (IAG Name Reactive Metal Destruction Site)	HRR ¹	Annual 1997 ³ Annual 1998 ⁷ Annual 2000 ²⁶ Annual 2003 ⁴²	Annual 1998 ⁷	-
141	6	900-141	Sludge Disposal	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷
153	IA	900-153	Oil Burn Pit No 2	HRR ¹	Annual 1999 ²³ Annual 2003 ⁴²	-	-
154	IA	900-154	Pallet Burn Site	HRR ¹	Annual 1999 ²³ Annual 2003 ⁴²	-	-
155	BZ	900-155	903 Lip Area	HRR ¹	Annual 1997 ³ Annual 1998 ⁷ Annual 1999 ²³ Annual 2000 ²⁶	-	-
165	IA	900-165	Triangle Area	HRR ¹	Annual 2003 ^{30 & 54}	-	2003 ^{30 & 54}
173	IA	900-173	South Dock - Building 991 (IAG Name Radioactive Site - 900 Area)	HRR ¹	-	-	-
175	IA	900-175	S&W Building 980 Container Storage Facility	HRR ¹	Annual 2003 ⁴⁹	-	2003 ⁴⁹
176	IA	900-176	S&W Contractor Storage Yard	HRR ¹	Annual 2003 ^{30 & 54}	-	2003 ^{30 & 54}
183	BZ	900-183	Gas Detoxification Area	HRR ¹	Annual 1997 ³ Annual 2000 ²⁶ Annual 2002 ³⁵	Annual 1997 ³ Annual 2000 ²⁶	2001 ³¹ 2002 ³²
184	IA	900-184	Building 991 Steam Cleaning Area	HRR ¹	-	-	-
210	IA	900-210	Building 980 Cargo Container, Unit 16	HRR ¹	Annual 1997 ³	Annual 1997 ³	1999 ²⁷

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
213	IA	900-213	Unit 15, 904 Pad Pondcrete Storage	HRR ¹	-	-	-
NA	IA	900-1300	RO Plant Sludge Drying Beds	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³⁴
NA	IA	900-1301	Building 991 Enclosed Area	HRR ¹	-	-	-
NA	IA	900-1302	Gasoline Spill	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	900-1303	Natural Gas Leak	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	900-1304	Chromic Acid Spill - Building 991	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	900-1305	Building 991 Roof	HRR ¹	-	-	EPA, 1992 ⁴ 2002 ³²
NA	IA	900-1306	Transformers 991-1 and 991-2	HRR ¹	Annual 1996 ²	Annual 1996 ²	-
NA	IA	900-1307	Explosive Bonding Pit	HRR ¹	Annual 1999 ²³	-	-
NA	IA	900-1308	Gasoline Spill Outside of Building 980	Quarterly 6 ¹⁶	Quarterly 8 ¹⁵ Annual 2001	Annual 2001	2002 ³²
NA	BZ	900-1309	OU 2 Field Treatability Unit Spill	Quarterly 6 ¹⁶	Quarterly 7 ⁹ (900-1312) Quarterly 8 ¹⁵ Annual 1999 ²³	Annual 1999 ²³	2000 ²⁹
NA	IA	900-1310	ITS Water Spill (identified as 000-502 in Quarterly 2, reassigned 900-1310 in Quarterly 7 ⁹)	Quarterly 2 ⁵	Quarterly 3 ⁶ Quarterly 7 ⁹ Annual 2000 ⁵⁰	-	Annual 2000 ⁵⁰

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
NA	IA	900-1311	Septic Tank East of Building 991	Quarterly 7 ⁹	Annual 1999 ²³ Annual 2000 ²⁶	Annual 1999 ²³ Annual 2000 ²⁶	2001 ³¹ 2002 ³²
NA	IA	900-1312	OU-2 Water Spill	Quarterly 7 ⁹	Annual 1999 ²³	Annual 1999 ²³	1999 ²⁹
192	IA	900-1313	Seep Area Near OU-2 Influent	Quarterly 9 ¹³	Annual 1999 ²³	Annual 1999 ²³	1999 ²⁹
101	IA	900-1314	Solar Evaporation Pond 207B Sludge Release	Quarterly 9 ¹³	-	Quarterly 9 ¹³	2002 ³⁴
NA	IA	900-1315	Tanker Truck Release on East Patrol Road, North of Spruce Ave	Quarterly 10 ¹¹	Quarterly 11 ¹⁸	Quarterly 11 ¹⁸	2002 ³⁴
NA	BZ	900-1316	Elevated Chromium (total) Identified During Geotechnical Drilling	Quarterly 10 ¹¹	-	Quarterly 10 ¹¹	2002 ³⁴
176	IA	900-1317	Soil Released from Wooden Crate in 964 Laydown Yard	Quarterly 11 ¹⁸	-	Quarterly 11 ¹⁸	2002 ³⁴
NA	IA	900-1318	Release of F001 Listed Waste Water to Soil (identified as 900-1307 in Annual 1997, reassigned 900-1318 in Annual 1998)	Annual 1997 ³	Annual 1998 ⁷ Annual 2000 ²⁶	Annual 1997 ³ Annual 2000 ²⁶	2001 ³¹ 2002 ³²
OFF-SITE AREA							
199	3	OFF-SITE AREA 1	Off-Site Area 1	HRR ¹	Annual 1997 ³	-	OU 3 CAD/ROD ²²
200	3	OFF-SITE AREA 2	Great Western Reservoir	HRR ¹	Annual 1997 ³	-	OU 3 CAD/ROD ²²
201	3	OFF-SITE AREA 3	Standley Lake	HRR ¹	Annual 1997 ³	-	OU 3 CAD/ROD ²²
202	3	OFF-SITE AREA 4	Mower Reservoir	HRR ¹	Annual 1997 ³	-	OU 3 CAD/ROD ²²
UNDER BUILDING CONTAMINATION							
NA	IA	UBC-122	Building 122 (UBC-122)	HRR ¹	-	-	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
NA	IA	UBC-123	Building 123 (UBC-123)	HRR ¹	Annual 1998 ⁷ Annual 2001 Annual 2003 ³⁹	Annual 2002	2003 ³⁹
NA	IA	UBC-125	Building 125 (UBC-125)	HRR ¹	Annual 2002 ³⁵	-	2002 ³³
NA	IA	UBC-331	Building 331 (UBC-331)	HRR ¹	-	-	-
NA	IA	UBC-371	Building 371 (UBC-371)	HRR ¹	Annual 2003 ⁵¹	-	2003 ⁵¹
NA	IA	UBC-374	Building 374 (UBC-374)	HRR ¹	Annual 2003 ⁵¹	-	2003 ⁵¹
NA	IA	UBC-439	Building 439 (UBC-439)	HRR ¹	-	-	-
NA	IA	UBC-440	Building 440 (UBC-440)	HRR ¹	-	-	-
NA	IA	UBC-441	Building 441 (UBC-441)	HRR ¹	-	-	-
NA	IA	UBC-442	Building 442 (UBC-442)	HRR ¹	-	-	-
NA	IA	UBC-444	Building 444 (UBC-444)	HRR ¹	-	-	-
NA	IA	UBC-447	Building 447 (UBC-447)	HRR ¹	-	-	-
NA	IA	UBC-528	Building 528 (UBC-528)	HRR ¹	-	-	-
NA	IA	UBC-559	Building 559 (UBC-559)	HRR ¹	-	-	-
NA	IA	UBC-701	Building 701 (UBC-701)	HRR ¹	-	-	-
NA	IA	UBC-707	Building 707 (UBC-707)	HRR ¹	-	-	-
NA	IA	UBC-731	Building 731 (UBC-731)	HRR ¹	-	-	-
NA	IA	UBC-770	Building 770 (UBC-770)	HRR ¹	-	-	-
NA	IA	UBC-771	Building 771 (UBC-771)	HRR ¹	Annual 2001	-	-
NA	IA	UBC-774	Building 774 (UBC-774)	HRR ¹	-	-	-
NA	IA	UBC-776	Building 776 (UBC-776)	HRR ¹	Annual 2003	-	-
NA	IA	UBC-777	Building 777 (UBC-777)	HRR ¹	Annual 2003	-	-

Appendix 1. HRR Sites at RFETS

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA in HRR	NFA Recommendation Approved
NA	IA	UBC-778	Building 778 (UBC-778)	HRR ¹	-	-	-
NA	IA	UBC-779	Building 779 (UBC-779)	HRR ¹	-	-	-
NA	IA	UBC-865	Building 865 (UBC-865)	HRR ¹	-	-	-
NA	IA	UBC-881	Building 881 (UBC-881)	HRR ¹	Annual 2003 ⁵³	-	2003 ⁵³
NA	IA	UBC-883	Building 883 (UBC-883)	HRR ¹	-	-	-
NA	IA	UBC-886	Building 886 (UBC-886)	HRR ¹	Annual 2001 Annual 2003 ⁵²	-	2003 ⁵²
NA	IA	UBC-887	Building 887 (UBC-887)	HRR ¹	-	-	-
NA	IA	UBC-889	Building 889 (UBC-889)	HRR ¹	Annual 2003 ³⁸	Annual 2002	2003 ³⁸
NA	IA	UBC-991	Building 991 (UBC-991)	HRR ¹	Annual 2003 ⁵¹	-	-
NA	NA	NA	PICs 1, 2, 3, 5, 7, 8, 10, 12, 13, 16, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 43, 45, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 58, 59, 60, 61	HRR ¹	2002	-	2002 ³⁴
NA	NA	NA	PICs 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, 57	HRR ¹	2002	-	-

1 Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, CO, June, 1992

2 Annual Update for the Historical Release Report, RF/ER-96-0046, Rocky Flats Environmental Technology Site, Golden, CO, September, 1996

3 Annual Update for the Historical Release Report, RF/RMRS-97-073 UN, Rocky Flats Environmental Technology Site, Golden, CO, September, 1997

4 EPA, 1992 Correspondence to R. Schassburger, DOE RFO, from M. Hestmark, EPA Region VIII, RE Potential Area of Concern Needing Further Investigation, December 23

5 Historical Release Report Second Quarterly Update, October 1, 1992 to January 1, 1993

6 Historical Release Report, Third Quarterly Update, January 1, 1993 to April 1, 1993

7 Annual Update for the Historical Release Report, RF/RMRS-98-269 UN, Rocky Flats Environmental Technology Site, Golden, CO, September

8 Historical Release Report, Fourth Quarterly Update, April 1, 1993 to July 1, 1993

- 9 Historical Release Report, Seventh Quarterly Update, January 1, 1994 to March 31, 1994
- 10 Historical Release Report, Fifth Quarterly Update, July 1, 1993 to October 1, 1993
- 11 Historical Release Report, Tenth Quarterly Update, October 1, 1994 to December 31, 1994
- 12 Corrective Action Decision/Record of Decision for OU 16 Low Priority Sites, Rocky Flats Environmental Technology Site, Golden, CO August, 1994
- 13 Historical Release Report, Ninth Quarterly Update, July 1, 1994 to September 30, 1994
- 14 Operable Unit 11 Final Combined Phases RFI/RI Report, Rocky Flats Environmental Technology Site, Golden, CO, June, 1995
- 15 Historical Release Report, Eighth Quarterly Update, April 1, 1994 to June 30, 1994
- 16 Historical Release Report, Sixth Quarterly Update, October 1, 1993 to January 1, 1994
- 17 Historical Release Report, Twelfth Quarterly Update, April 1, 1995 to June 30, 1995
- 18 Historical Release Report, Eleventh Quarterly Update, January 1, 1995 to March 31, 1995
- 19 CDPHE, 1998, Excavated Soil Adjacent to Building 701 (cc mail from C Spreng to L Brooks), Rocky Flats Environmental Technology Site, Golden, CO, July
- 20 Corrective Action Decision/Record of Decision, Operable Unit 1 881 Hillside Area, IHSS 119 1, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, February, 1997
- 21 Corrective Action Decision/Record of Decision for OU 15 Inside Building Closures, Rocky Flats Environmental Technology Site, Golden, CO, August, 1995
- 22 Final Corrective Action Decision/Record of Decision Declaration, Operable Unit 3, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July, 1997
- 23 Annual Update for the Historical Release Report, RE/RMRS-99-428 UN, Rocky Flats Environmental Technology Site, Golden, CO, September, 1999
- 24 Historical Release Report, First Quarterly Report submitted September 30, 1992
- 25 KH, 2000, Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999), Rocky Flats Environmental Technology Site, Golden, CO, September
- 26 Annual Update for the Historical Release Report, KH-00-900 UN, Rocky Flats Environmental Technology Site, Golden, CO, September, 2000
- 27 EPA, CDPHE, 1999 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE 1997 Annual HRR Review, July 9, 1999
- 28 EPA, CDPHE, 1999 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE 1998 Annual HRR Review, July 9, 1999
- 29 EPA, CDPHE, 2000 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE 1999 Annual HRR Review, June 23, 2000
- 30 EPA, CDPHE, 2001 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE NFA PAC 100-607, April 12, 2001
- 31 CDPHE, 2001, Preliminary Electronic Correspondence to M C Broussard, from C Spreng CDPHE, RE 2000 Annual HRR Review, September 2001
- 32 EPA, CDPHE, 2002 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE Approval of NFA Designation for IHSSs & PACs, February 14, 2002

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- 33 EPA, CDPHE, 2002 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE No Further Action Justification for Bldg 125 UBC, April 2, 2002
- 34 EPA, CDPHE, 2002 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE Approval of NFA designation for IHSSs, PACs, and PICs, September 26, 2002
- 35 Additional clarification supporting NFA status is provided in the 2002 HRR narratives, based on discussions of FY02 HRR Working Group
- 36 Further clarification of NFA status is provided by NFA Approval Letter, based on FY02 HRR Working Group discussion
- 37 CDPHE, 2003 Correspondence to R DiSalvo, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 700-12, May 15
- 38 CDPHE, 2003 Correspondence to R DiSalvo, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 800-6, March 25
- 39 CDPHE, 2003 Correspondence to R DiSalvo, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Groups 100-4 and 100-5, April 22
- 40 CDPHE, 2003 Correspondence to R DiSalvo, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 600-6, May 15
- 41 CDPHE, 2003 Correspondence to R DiSalvo, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 500-7, June 9
- 42 EPA, 2003 Correspondence to R DiSalvo, DOE RFO, from T Rehder, EPA Region VIII, RE No Further Action Justification for Ash Pits PAC Reference Numbers SW-133 1, SW-133 2, SW-133 4 and 1702 (dated June 11, 2003), NFAA Justification for Trench T-7 PAC Reference Number NE 111 4 (dated May 21, 2003), NFAA Justification Trenches T-3 and T-4 PAC Reference Number 111 1 (dated May 21, 2003), June 12
- 43 CDPHE, 2003 Correspondence to R DiSalvo, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 600-2, June 19
- 44 CDPHE, 2003 Correspondence to R DiSalvo, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 300-1, June 20
- 45 CDPHE, 2003 Correspondence to J Legare, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 600-1, June 24
- 46 CDPHE, 2003 Correspondence to J Legare, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 400-10, July 15
- 47 CDPHE, 2003 Correspondence to J Legare, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 500-6, July 16
- 48 CDPHE, 2003 Correspondence to J Legare, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 300-6, July 21
- 49 CDPHE, 2003 Correspondence to J Legare, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 900-4&5, July 23
- 50 CDPHE, 2003 Correspondence to J Legare, DOE RFO, from S Gunderson, CDPHE, T Rehder, EPA Region VIII RE Final Closeout Report for IHSS Group 000-1, July 29
- 51 CDPHE, 2003 Correspondence to J Legare, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Groups 300-3 and 300-4, August 21
- 52 CDPHE, 2003 Correspondence to J Legare, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 800-4, May 15
- 53 CDPHE, 2003 Correspondence to J Legare, DOE RFO, from S Gunderson, CDPHE, RE Final Closeout Report for IHSS Group 800-2, July 16
- 54 CDPHE, 2003 Correspondence to J Legare, DOE RFO, from S Gunderson, CDPHE, RE Final Data Summary Report for IHSS Group 000-1, July 29

Appendix 2

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800-6
C O.

STATE OF COLORADO

Bill Owens Governor
Douglas H. Benevento Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S
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Colorado Department
of Public Health
and Environment

March 25, 2003

Richard J. DiSalvo
Acting Assistant Manager for Environment and Stewardship
U.S. Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

RE: Final Closeout Report for IHSS Group 800-6

Dear Mr. DiSalvo,

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division concurs that this IHSS Group needs No Further Accelerated Action (NFAA). If you have any questions regarding this correspondence please contact me at (303) 692-3367, Elizabeth Pottorff at 303-692-3429 or Carl Spreng at 303-692-3358

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

cc Norma Castaneda, DOE
Tim Rehder, EPA
Lane Butler, KH
Dave Shelton, KH
Mark Sattelberg, U.S. F&W
Administrative Records Building T130G

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Laboratory and Radiation Services Division
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Denver, Colorado 80230-6928
(303) 692-3090



**Colorado Department
of Public Health
and Environment**

DUPLICATE DATE
ACTION

0387 RF 23

DIST.	LM	SC
BARDON, J.H.	X	X
BONAR, E.S.	X	X
BOCKETT, G.A.		
BOX, C.A.	X	X
BREHART, K.R.		
ELBERT, J.		
ELDER, E.S.E.		
FERRELL, D.W.		
FELLM, S.		
FISMAN, A.L.		
SCOTT, J.J.		
GL, J.H.		
GLAY, D.C.	X	X
GL, J.W.		
GL, J.L.		
GLINEZ, L.A.	X	X
GL, R.E.	X	X
GL, M.	X	X
GL, K.F.		
GL, D.A.D.		
GL, D.C.	X	X
GL, M.S.		
GL, D.	X	X
GL, J.L.		
GL, L.	X	X
GL, L.	X	X

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April 22, 2003

Richard J. DiSalvo

Acting Assistant Manager for Environment and Stewardship

U.S. Department of Energy

Rocky Flats Field Office

10808 Highway 93, Unit A

Golden, Colorado 80403-8200

RE: Final Closeout Report for IHSS Groups 100-4 and 100-5

Dear Mr. DiSalvo,

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division approves this closeout report and concurs that these IHSS Groups need No Further Accelerated Action (NFAA). (The document needs correction to this language on page 1.) We appreciate the modifications your staff made to this document to address our all comments and also include a comparison to the proposed Wildlife Refuge Worker action levels

Comments regarding changes that were previously requested for the dioxin discussion in 100-5 are attached. If there are questions about those comments please contact Tracy Hammon at (303) 692-2693.

If you have any questions regarding this correspondence please contact me at (303) 692-3367, Elizabeth Pottorff at 303-692-3429, David Kruckek at (303) 692-3328, or Carl Spreng at 303-692-3358

Sincerely,

John G. Galt

Steven H. Gunderson
RPCA Project Coordinator

cc Norma Castaneda, DOE
Tim Rehder, EPA
Lane Butler, KH
Dave Shelton, KH
Mark Sattelberg, U S F&W
Administrative Records Bureau

Administrative Records Building T130G

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Comms. Control RFP

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Bill Owens, Governor
Douglas H. Benvenuto, Executive Director
**CORRESPONDENCE
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Denver, Colorado 80230-6928
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Colorado Department
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and Environment

DIST	CTR	ENC
BERARDINI, J.H.	X	
BOGGAR, E.S.	X	
BUCKETT, G.A.		
DECK, C.A.	X	
DEGENHART, K.R.		
DIETER, T.J.		
DIETERLE, S.E.		
FERRERA, D.W.	X	
FERRI, M.S.		
GERMAN, A.L.		
GIACOMINI, J.J.		
ISOM, J.H.		
LINDSAY, D.C.	X	
LONG, J.W.		
LYLE, J.L.		
MARTINEZ, L.A.	X	
MAGEL, R.E.	X	
MORAN, K.	X	
MULLAM, A.M.	X	
MURPHY, K.P.		
RODGERS, A.D.		
SHELTON, D.C.	X	
SPEARS, M.S.		
K.D.		
Y.B.	X	
S.J.L.		
BUTLER, L.	X	
BROOKS, L.	X	

May 15, 2003

Richard J. DiSalvo
Acting Assistant Manager for Environment and Stewardship
U.S. Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

RE: Final Data Summary Report for IHSS Group 600-6

Dear Mr. DiSalvo:

Based on agreement reached on our comments at a meeting on May 8 the Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division approves this data summary report and concurs that this IHSS Group needs No Further Accelerated Action (NFAA)

If you have any questions regarding this correspondence please contact me at (303) 692-3367, Elizabeth Pottorff at 303-692-3429, Carl Spreng at 303-692-3358

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

COR CONTROL X
ADMIN RECORD X
PATS/130

cc Norma Castaneda, DOE
Tim Rehder, EPA
Lane Butler, KH
Dave Shelton, KH
Mark Sattelberg, U.S. F&W
Administrative Records Building T130G

Reviewed for Addressee
Corres Control RFP

5/22/03
Date By

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STATE OF COLORADO

Bill Owens, Governor
Douglas H. Benevento, Executive Director

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Colorado Department
of Public Health
and Environment

DIST.	LTR	ENC
BERARDINI, J.H.	X	
BOGNALE, E.S.	X	
CROCKETT, G.A.		
DECK, C.A.	X	
DEGENHART, K.R.		
DIETER, T.J.		
DIETERLE, S.E.		
FERRERA, D.W.	X	
FERRIS, M.S.		
GERMAN, A.L.		
GIACOMINI, J.J.		
SOM, J.H.		
JINDAY, D.C.		
LONG, J.W.		
LYE, J.L.		
MARTINEZ, I.A.	X	
WAGEL, R.E.	X	
WAGEL, K.	X	
WAGEL, A.H.		
WAGEL, S.K.P.		
WAGEL, A.D.		
WAGEL, D.C.	X	
WAGEL, M.S.		
WAGEL, K.D.		
WAGEL, J.R.		
WAGEL, J.L.		
BUTLER, L.	X	
BRACKS, L.	X	

June 9, 2003

Richard J. DiSalvo
Acting Assistant Manager for Environment and Stewardship
U.S. Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

RE: Final Data Summary Report for IHSS Group 500-7

Dear Mr. DiSalvo

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division approves this data summary report and concurs that this IHSS Group needs No Further Accelerated Action (NFAA).

If you have any questions regarding this correspondence please contact me at (303) 692-3367, Elizabeth Pottorff at 303-692-3429, Carl Spreng at 303-692-3358

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

JOB CONTROL
DATA RECORD
AT/130

Reviewed for Addressee
Comes. Control RFP

4/16/03
By

cc Norma Castaneda, DOE
Tim Rehder, EPA
Lane Butler, KH
Dave Shelton, KH
Mark Sattelberg, U S F&W
Administrative Records Building T120G

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5400-1

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NFAA

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ASH
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 8
999 16TH STREET - SUITE 300
DENVER, CO 80202-2406
Phone 800-227-8817
<http://www.epa.gov/region08>

Fax to
Rick DiSalvo
303 966 6054
from
Tim Rehder

Ref 8EPR-F

June 12, 2003

Richard J DiSalvo
Acting Assistant Manager for Environmental Stewardship
U S Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

Subject No Further Accelerated Action (NFAA) Justification for Ash Pits PAC Reference Number(s) SW-133.1, SW-133.2, SW-133.4 and 1702 (dated June 11, 2003), NFAA Justification for Trench T-7 PAC Reference Number: NE 111.4 (dated May 21, 2003), NFAA Justification Trenches T-3 and T-4 PAC Reference Number 111.1 (dated May 21, 2003)

Dear Mr. DiSalvo

The Environmental Protection Agency has reviewed the documents referenced above and agree that the residual contamination at the Ash Pits, and Trenches T-3, T-4 and T-7 does not pose a significant threat to human health given that Rocky Flats will become a wildlife refuge at the completion of the cleanup, and that a wildlife refuge worker would be the individual with the highest potential for exposure to contaminants. EPA therefore agrees that no further accelerated action is necessary at the Ash Pits, and Trenches T-3, T-4 and T-7 to protect human health.

However, considerable work still needs to be conducted to determine whether residual contamination at Rocky Flats poses a significant ecological risk. Until that work is complete, EPA cannot assert that NFAA determinations for the Ash Pits, and Trenches T-3, T-4 and T-7 are protective of both human health and the environment. EPA looks forward to working with DOE and its contractor on the ecological portion of the Comprehensive Risk Assessment that is currently underway.

Furthermore, since the Ashpits, and Trenches T-3, T-4 and T-7 contain contamination at levels that would not allow for unrestricted use, a comprehensive, enforceable plan for long-term stewardship of these areas is critical to assure that the remedy for Rocky Flats continues to be protective. EPA, again, looks forward to working with the DOE and the State of Colorado in developing such a plan and putting the necessary agreements into place

600-2
GO

RECEIVED

JUN 30 A 9:16

STATE OF COLORADO

RRS CONTROL
COMING LTR NO

00601 RF03

DUE DATE
ACTION

Bill Owens Governor

Douglas H. Benevento Executive Director

CORRESPONDENCE
CONTROL

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr S
Denver Colorado 80246 1530
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Denver, Colorado 80230-6928
(303) 692-3090

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Colorado Department
of Public Health
and Environment

DIST	LTR	ENC
BERARDINI J.H.	X	
BOGNER E.S.	X	
CROCKETT G.A.		
DECK C.A.	X	
DEGMART K.R.		
DIETER T.J.		
DIETERLE S.E.		
FERRERA D.W.	X	
FERRIS M.S.		
GIACOMINI J.J.		
ISOM J.H.		
LINDSAY D.C.	X	
LONG J.W.		
LYLE J.L.		
MARTINEZ L.A.	X	
NAGEL R.E.	X	
NORTH K.		
PARKER A.M.	X	
RODGERS A.D.		
SCHWEN D.C.	X	
SHAW M.S.		
THORNTON D.		
THORNTON R.	X	
WILLIAMS J.L.		
GP, L.	X	
3KADRE, L.	X	
2HBM, C.	X	

June 19, 2003

Richard J DiSalvo

Acting Assistant Manager for Environment and Stewardship

U S Department of Energy

Rocky Flats Field Office

10808 Highway 93, Unit A

Golden, Colorado 80403-8200

RE: Final Closeout Report for IHSS Group 600-2 (Storage Shed South of Bldg. 334)

Dear Mr DiSalvo

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division approves this closeout report and concurs that these IHSS Groups need No Further Accelerated Action (NFAA)

If you have any questions regarding this correspondence please contact me at (303) 692-3367, Elizabeth Pottorff at 303-692-3429, David Kruckek at (303) 692-3328.

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

OR CONTROL X
OWN RECORD X
ATSC130

Reviewed for Addressee
Comes Control RFP

30/03
By

cc Norma Castaneda, DOE
Tim Rehder, EPA
Lane Butler, KH
Dave Shelton, KH
Mark Sattelberg, U.S F&W
Administrative Records Building T130G

7/1/03
7/1/03
7/1/03

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C-5

STATE OF COLORADO

Bill Owens Governor
Douglas H. Benvenuto, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

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Denver Colorado 80230-6928
(303) 692-3090



Colorado Department
of Public Health
and Environment

June 20, 2003

Richard J. DiSalvo
Acting Assistant Manager for Environment and Stewardship
U.S. Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

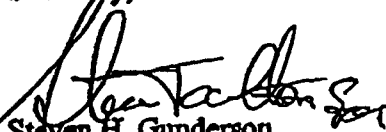
RE: Final Closeout Report for IHSS Group 300-1

Dear Mr. DiSalvo:

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division approves this closeout report and concurs that these IHSS Groups need No Further Accelerated Action (NFAA). Contaminants identified in IHSS 300-134(N) may need further evaluation for their contribution to the Industrial Area Plume as part of the groundwater plume remedial decision.

If you have any questions regarding this correspondence please contact me at (303) 692-3367, Elizabeth Pottorff at 303-692-3429, Carl Spreng at 303-692-3358.

Sincerely,


Steven H. Gunderson
RFCA Project Coordinator

cc: Norma Castaneda, DOE
Tim Rehder, EPA
Lane Butler, KH
Dave Shelton, KH
Mark Sattelberg, U.S. F&W
Administrative Records Building T130G

Post-It® Fax Note	7671	Date	6-20-03	Page	1
Manuela Burgess		From	E. Pottorff		
Co./Dept.		Co.			
Phone #		Phone # 692-3429			
Fax # 966-5180		Fax #			

265

600-1
C.O

RECEIVED

2003 JUN 30 A

STATE OF COLORADO

RRES CONTROL
INCOMING LTR NO

00602 RF03

DUE DATE
ACTION

Bill Owens Governor

Douglas H. Benevento Executive Director

CORRESPONDENCE
CONTROL

Dedicated to protecting and improving the health and environment of the people of Colorado

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8100 Lowry Blvd
Denver, Colorado 80230-6928
(303) 692-3090

<http://www.cdphe.state.co.us>



Colorado Department
of Public Health
and Environment

DIST	LR	ENC
BERARDINI, J.H.	X	
BOGVAR, E.S.	X	
CROCKETT, G.A.		
DECK, C.A.	X	
DEGENHART, K.R.		
DIETER, I.J.		
DIETER, S.E.		
FERRERA, D.W.	X	
FERRIS, M.S.		
GIACOMINI, J.J.		
ISOM, J.H.		
LINDSAY, D.C.	X	
LONG, J.W.		
LYLE, J.L.		
MARTINEZ, L.A.	X	
MAGEL, R.F.	X	
NORTH, K.		
PARKER, A.M.	X	
REYNOLDS, A.D.		
SCHWAB, D.C.	X	
SHAW, M.S.		
THICE, K.D.	X	
TRIPLE, R.B.	X	
WMS, J.L.		
Z. FLOR, L.	X	
BROOKS, L.	X	
ZAHM, C.	X	

June 24, 2003

Joseph A. Legare
Assistant Manager for Environment and Stewardship
U.S. Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

RE: Final Closeout Report for IHSS Group 600-1(PAC 600-1001)

Dear Mr. Legare

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division approves this closeout report and concurs that this IHSS Group needs No Further Accelerated Action (NFPA).

If you have any questions regarding this correspondence please contact me at (303) 692-3367, David Kruchek at (303) 692-3328 or Elizabeth Pottorff at 303-692-3429

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

COB CONTROL X
ADMIN RECORD X
PATS130

Reviewed for Addressee
Comes Control RFP

10/30/03
Jatb Byf

cc Norma Castaneda, DOE
Tim Rehder, EPA
Lane Butler, KH
Dave Shelton, KH
Mark Sattelberg, U.S F&W
Administrative Records Building T150G

ORDER #

JUNE

266

400-10
DS

STATE OF COLORADO

Bill Owens, Governor
Douglas H. Benevento, Executive Director

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Denver, Colorado 80230-6928
(303) 692-3090

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Colorado Department
of Public Health
and Environment

July 15, 2003

Joseph A. Legare
Assistant Manager for Environment and Stewardship
U.S. Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

03 JUL 21 PM 1:25
GCBH

RE: Final Data Summary Report for IHSS Group 400-10

Dear Mr. Legare:

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division approves this data summary report and concurs that this IHSS Group needs No Further Accelerated Action (NFAA)

If you have any questions regarding this correspondence please contact me at (303) 692-3367, Elizabeth Pottorff at 303-692-3429, Carl Spreng at 303-692-3358

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

cc: Norma Castaneda, DOE
Tim Rehder, EPA
Lane Butler, KH
Dave Shelton, KH
Mark Sattelberg, U.S. F&W
Administrative Records Building T130G

267

500-6
Data Sum.

STATE OF COLORADO

Bill Owens, Governor
Douglas H. Benevento, Executive Director

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Denver, Colorado 80230-6928
(303) 692-3090



Colorado Department
of Public Health
and Environment

July 16, 2003

Joseph A. Legare
Assistant Manager for Environment and Stewardship
U.S. Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

03 JUL 21 PM 1:25
GPH

RE: Final Data Summary Report for IHSS Group 500-6

Dear Mr. Legare:

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division approves this data summary report and concurs that this IHSS Group needs No Further Accelerated Action (NFAA).

If you have any questions regarding this correspondence please contact me at (303) 692-3367, Elizabeth Pottorff at 303-692-3429, Carl Spreng at 303-692-3358.

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

cc. Norma Castaneda, DOE
Tim Rehder, EPA
Lane Butler, KH
Dave Shelton, KH
Mark Sattelberg, U.S. F&W
Administrative Records Building T130G

300-6
Dr 1-500

STATE OF COLORADO

Bill Owens Governor
Douglas H. Benevento Executive Director

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Denver, Colorado 80230-6928
(303) 692-3090



Colorado Department
of Public Health
and Environment

July 21, 2003

Joseph A. Legare
Assistant Manager for Environment and Stewardship
U.S. Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

83 JUL 25 AM 10:41
GARY

RE: Final Data Summary Report for IHSS Group 300-6

Dear Mr. Legare

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division approves this data summary report and concurs that this IHSS Group needs No Further Accelerated Action (NFAA)

If you have any questions regarding this correspondence please contact me at (303) 692-3367, Elizabeth Pottorff at 303-692-3429, Carl Spreng at 303-692-3358

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

cc: Norma Castaneda, DOE
Tim Rehder, EPA
Lane Butler, KH
Dave Shelton, KH
Mark Sattelberg, U.S. F&W
Administrative Records Building T130G

269

5400

900 4:5
DATA Summ.

STATE OF COLORADO

Bill Owens, Governor
Douglas H. Benvenuto, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr S Laboratory and Radiation Services Division
Denver, Colorado 80246-1530 8100 Lowry Blvd
Phone (303) 692-2000 Denver, Colorado 80230-6928
TDD Line (303) 691-7700 (303) 692-3090
Located in Glendale, Colorado
<http://www.cdphe.state.co.us>



Colorado Department
of Public Health
and Environment

July 23, 2003

Mr. Joseph Legare
Assistant Manager for Environment and Stewardship
U.S. Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

RE: Approval, Data Summary Report, IHSS Group 900-4&5 (PAC 900-175, S&W B980 Contractor Storage Facility), dated July 2003

Dear Mr. Legare:

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division (the Division) has reviewed the subject document in response to the Division's comments.

The report is hereby approved as a No Further Accelerated Action (NFAA) document specific to PAC 900-175, the S&W Building 980 Contractor Storage Facility PAC 1308, a Gasoline Spill Outside Building 980, was granted similar status (NFA) on February 14, 2002.

The Division's extensive comments on the draft addendum, dated November 2002 and including replacement pages dated March 11, 2003, were discussed and ultimately resolved with facility representatives. The comments, which included a high percentage with respect to data coverage and quality, are attached for reference.

The Division also received a version of the addendum dated June 2003. It could not be approved because it was not in the final form agreed to by the Division and did not contain illustrations, i.e., Figures 1 and 2.

If you have any questions regarding this correspondence, please contact me at (303) 692-3367 or Harlen Ainscough at 303-692-3337.

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

Attachment

cc Ruck DiSalvo, DOE
Norma Castaneda, DOE
Tim Rehder, EPA
Administrative Records Building T130G

Lane Butler, KH
Dave Shelton, KH
Mark Sattelberg, U S F&W

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2003 AUG 18 A 9 42

CORRESPONDENCE
CONTROL



Colorado Department
of Public Health
and Environment

July 29, 2003

Mr. Joe Legare
Assistant Administrator for Environment and Infrastructure
U.S. Department of Energy-RFFO
10808 Highway 93, Unit A
Golden CO 80401-8200

RE: Data Summary Report, IHSS Group 000-1

Dear Mr. Legare:

The Colorado Department of Public Health and Environment and the Environmental Protection Agency have reviewed replacement pages for the above-referenced report, which adequately respond to our earlier comments. Therefore, the Data Summary Report for IHSS Group 000-1 is approved. With this approval, the agencies concur that no further accelerated action is necessary for IHSS Group 000-1.

As in the past, we request that the costs for this project be reported to the agencies separately.

If you have any questions please contact Carl Spreng (CDPHE) at 303-692-3358, Elizabeth Pottorff (CDPHE) at 303-692-3429, or Jean McKenzie (EPA) at 303-312-6258.

Sincerely,

Steven H. Gunderson

Tim Rehder

Steven H. Gunderson
RFCA Project Coordinator
Colorado Department of Public
Health and Environment

Tim Rehder
Rocky Flats Project Manager
Environmental Protection Agency

COR CONTROL ☒
ADMIN RECORD ☒
PATS/130 ☒

Reviewed for Addressee
Corres Control RFP

8/18/03 *by*
Date By

cc Scott Surovchak, DOE
Lane Butler, K-H
Marla Broussard, K-H
Administrative Record, T130G

Dan Miller, AGO
Susan Chaki, CDPHE
Steve Tarlton, CDPHE-RFOU

Project #

ORDER #

2026

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Revised 07/03

CORRES CONTROL
INCOMING LTR NO

10762 RF03

DUE DATE
ACTION

DIST.	LTR	ENC
BERARDINI, J.H.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BOGNAR, E.S.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CROCKETT, G.A.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DECK, C.A.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DEGENHART, K.R.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DIETER, T.J.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DIETERLE, S.E.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FERRERA, D.W.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FERRI, M.S.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GIACOMINI, J.J.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ISOM, J.H.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
LINDSAY, D.C.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
LONG, J.W.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
LYLE, J.L.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MARTINEZ, J.A.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
HAGEL, R.F.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
NORTH, K.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PARKER, A.M.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
RODGERS, A.D.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SHELTON, D.C.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SPARS, M.S.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DE K.D.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
R.N.R.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
WILLIAMS, J.L.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ITLER, L.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
USSARD, M.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BROOKS, L.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

300 304
C.S

STATE OF COLORADO

Bill Owens, Governor
Douglas H. Benevento, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr S
Denver, Colorado 80246-1530
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Denver, Colorado 80230-6928
(303) 692-3090



Colorado Department
of Public Health
and Environment

August 21, 2003

Mr. Joe Legare
Acting Assistant Manager for Environment and Stewardship
U.S. Department of Energy, Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, CO 80403-8200

RE: Data Summary Report IHSS Groups 300-3 and 300-4 (B371 & B374) – Approval

Dear Mr. Legare:

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division has reviewed the Data Summary Report for IHSS Groups 300-3 and 300-4, dated August 2003. The IHSS Groups 300-3 and 300-4 are the investigation for possible UBC for B371 and B374. The Division is hereby approving this Data Summary Report for No Further Accelerated Action (NFAA)

As discussed, please provide a replacement page 52, with text change to Section 6.2.2, changing the last word in the 4th sentence from "greater" to "less".

If you have any questions regarding this correspondence please contact me at (303) 692-3367, David Kruchek at (303) 692-3328, or ~~Heidi H. Gunderson~~ (303) 692-3337.

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

cc: Norma Castaneda, DOE
Lanc Butler, KH
Dave Shelton, KH
Administrative Records Building T130G

Tim Rehder, EPA
Gary Kleeman, EPA
Mark Sattelberg, USFWS

8004
C.D

RECEIVED

2003 MAY 22 P 2 50

STATE OF COLORADO

CORRESPONDENCE
INCOMING LTR NO

00478 RF03

DUE DATE
ACTION

Bill Owens, Governor
Douglas H. Benveniste, Executive Director
Dedicated to protecting and improving the health and environment of the people of Colorado
4300 Cherry Creek Dr. S
Denver, Colorado 80246-1530
Phone (303) 692-2000
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8100 Lowry Blvd
Denver, Colorado 80230-6928
(303) 692-3090
<http://www.cdphe.state.co.us>



Colorado Department
of Public Health
and Environment

DIST	LTR	ENC
BERARDINI, J. H.	X	
BOGNER, E. S.	X	
CROCKETT, G. A.		
DECK, C. A.	X	
DEGENHART, K. R.		
DIETER, T. J.		
DIETER, S. E.		
FERRERA, D. W.	X	
FERRI, M. S.		
GERMAN, A. L.		
GIACOMINI, J. J.		
ISOM, J. H.		
LINDSAY, D. C.	X	
LONG, J. W.		
LYLE, J. L.		
MARTINEZ, L. A.	X	
NAGEL, R. E.	X	
NORTH, K.	X	
PARKER, A. M.	X	
POWERS, K. P.		
RODGERS, A. D.		
SHELTON, D. C.	X	
TS, M. S.		
K. D.		
L. R.	X	
S. J. L.		
BUTLER, L.	X	
BROOKS, L.	X	

May 15, 2003

Richard J. DiSalvo
Acting Assistant Manager for Environment and Stewardship
U.S. Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

RE: Final Closeout Report for IHSS Group 800-4 (February 2003 modified 3/5/03)

Dear Mr. DiSalvo

Based on provision of modifications described in the May 1 Response to Comments and agreements reached at the May 8 meeting in the new Final Closeout Report, our comments on this document have been resolved. The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division approves this Closeout Report and concurs that IHSS Group 800-4 needs No Further Accelerated Action (NFAA).

If you have any questions regarding this correspondence please contact me at (303) 692-3367, Elizabeth Pottorff at 303-692-3429, David Kruchek at (303) 692-3328

Sincerely,

Steven H. Gunderson

RFCA Project Coordinator

COR. CONTROL
ADMIN. RECORD
PATS/130

Reviewed for Addressee
Corres. Control RFP

5/22/03
Date By

Ref Ltr #

ORDER #

5400-1

cc Norma Castaneda, DOE
Tim Rehder, EPA
Lane Butler, KH
Dave Shelton, KH
Mark Sattelberg, U.S. F&W
Administrative Records Building T130G

273

STATE OF COLORADO

Bill Owens, Governor
Douglas H. Benvenuto, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S
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Located in Glendale, Colorado

Laboratory Services Division
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Denver, Colorado 80230-6928
(303) 692-3090

<http://www.cdphe.state.co.us>



Colorado Department
of Public Health
and Environment

July 16, 2003

Mr. Joe Legare
Acting Assistant Manager for Environment and Stewardship
U.S. Department of Energy, Rooky Flats Field Office
10808 Highway 93, Unit A
Golden, CO 80403-8200

RE: Data Summary Report IHSS Group 800-2 (B881) -- Approval

Dear Mr. Legare,

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division has reviewed the Data Summary Report for IHSS Group 800-2, dated June 2003 as modified. The IHSS Group 800-2 includes the UBC for B881, PAC 800-1205 (B881 East Dock), and IHSS 000-121 (the OPWL Tank 39). The Division is hereby approving this Data Summary Report for No Further Accelerated Action (NFAA).

Although we are approving this report and no accelerated action may be necessary, it needs to be recognized that the area with high levels of Barium will still need to be properly identified and managed during future demolition/removal actions that will occur in this area. If excavation occurs, the same will be necessary for the areas with high Lead levels. Future concerns regarding this remaining contamination should be resolved through the consultative process.

If you have any questions regarding this correspondence please contact me at (303) 692-3367, David Kruchek at (303) 692-3328, or Elizabeth Pottorff at (303) 692-3429.

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

cc Norma Castaneda, DOE
Lane Butler, KH
Dave Shelton, KH
Karen Wiemelt, KH
Administrative Records Building T130G

Tim Rehder, EPA
Gary Kleeman, EPA
Mark Sattelberg, USFWS
Steve Tower, DOE

Post-It® Fax Note	7671	Date	7/17	Page	1
To	Marla Bressan	From	D. Kruchek		
Co/Dept.		Co.			
Phone #		Phone #			
Fax #	966 5180	Fax #			

000-1
DATA Sum

RECEIVED

700) AUG 18 A 9 48
COPRESPONDENCE
CONTROL



Colorado Department
of Public Health
and Environment

Revised 07/03

CORRES. CONTROL
INCOMING LTR NO

0762 RF03

DUE DATE
ACTION

DIST.	LTR	ENC
BERARDINI, J.H.	X	
BOGNAR, E.S.	X	
CROCKETT, G.A.		
DECK, C.A.	X	
DEGENHART, K.R.		
DIETER, T.J.		
DIETERLE, S.E.		
FERRERA, D.W.	X	
FERRI, M.S.		
GIACOMINI, J.J.		
ISOM, J.H.		
LINDSAY, D.C.	X	
LONG, J.W.		
LYLE, J.L.		
MARTINEZ, L.A.	X	
NAGEL, R.E.	X	
NORTH, K.		
PARKER, A.M.	X	
RODGERS, A.D.		
SHELTON, D.C.	X	
SPEARS, M.S.		
TRICE, K.D.		
TUOH, N.R.	X	
WILLIAMS, J.L.		
TITLER, L	X	
USSARD, M.	X	
BROOKS, L	X	

July 29, 2003

Mr. Joe Legare
Assistant Administrator for Environment and Infrastructure
U.S. Department of Energy-RFFO
10808 Highway 93, Unit A
Golden CO 80401-8200

RE: Data Summary Report, IHSS Group 000-1

Dear Mr. Legare:

The Colorado Department of Public Health and Environment and the Environmental Protection Agency have reviewed replacement pages for the above-referenced report, which adequately respond to our earlier comments. Therefore, the Data Summary Report for IHSS Group 000-1 is approved. With this approval, the agencies concur that no further accelerated action is necessary for IHSS Group 000-1.

As in the past, we request that the costs for this project be reported to the agencies separately

If you have any questions please contact Carl Spreng (CDPHE) at 303-692-3358, Elizabeth Pottorff (CDPHE) at 303-692-3429, or Jean McKenzie (EPA) at 303-312-6258

Sincerely,

Steven H. Gunderson

Tim Rehder

COR. CONTROL	X
ADMIN. RECORD	X
PATS/130	

Steven H. Gunderson
RFCA Project Coordinator
Colorado Department of Public
Health and Environment

Tim Rehder
Rocky Flats Project Manager
Environmental Protection Agency

Reviewed for Addressee
Corres. Control RFP

8/18/03
Date By cc

Scott Surovchak, DOE
Lane Butler, K-H
Marla Broussard, K-H
Administrative Record, T130G

Dan Miller, AGO
Susan Chaki, CDPHE
Steve Tarlton, CDPHE-RFOU

Ref Ltr #

ORDER #

2026

275

Appendix 3

Appendix 4

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 03-RF-01475; JLB-095-03)

Historical Release Report

August 1, 2002 Through August 1, 2003

Plate 1:

Individual Hazardous Substance Sites by Consolidated Operable Unit

As of September 2003

September 25, 2003

CERCLA Administrative Record Document, SW-A-004837

U S DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

279

SW-A-004837

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 03-RF-01475; JLB-095-03)

Historical Release Report

August 1, 2002 Through August 1, 2003

Plate 2:

No Further Action Individual Hazardous Substance Sites and Potential Areas of Concern (Including Proposed NFAs)

As of September 2003

September 25, 2003

CERCLA Administrative Record Document, SW-A-004837

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**

GOLDEN, COLORADO

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 03-RF-01475; JLB-095-03)

Historical Release Report

August 1, 2002 Through August 1, 2003

Plate 3:

Original Process Waste Lines And New Process Waste Lines

September 25, 2003

CERCLA Administrative Record Document, SW-A-004837

**U S DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**

GOLDEN, COLORADO

281

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 03-RF-01475; JLB-095-03)

Historical Release Report

August 1, 2002 Through August 1, 2003

Plate 4:

Potential Areas of Concern and Under Building Contamination Sites

As of September 2003

September 25, 2003

CERCLA Administrative Record Document, SW-A-004837

U S DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

282
282

Figure 11
Historical Release Report
PAC Area Boundaries

EXPLANATION

- N PAC Area Designated Boundary
 - N 1 d est l Area Boundary
 - N Property Purchase Boundary
 - 1961 Purchase (2 558 Acres)
 - 1974 Purchase
 - 1975 Purchase (3 836 Acres)
 - 1976 Purchase
- Standard Map Features
- Building
 - Lake and pond
 - State main, ditches, other drainage features
 - Paved road
 - D road

DATA SOURCE: STATE FEATURES.
Building, water, drainage, roads and other features were digitized from the 1985 aerial photograph by the U.S. Army Corps of Engineers, Vicksburg, Mississippi.

NOTES: 1. The map was prepared by the U.S. Army Corps of Engineers, Vicksburg, Mississippi, in 1985. 2. The map was prepared by the U.S. Army Corps of Engineers, Vicksburg, Mississippi, in 1985.



Scale 21,320
Inches represent approximately

State Plane Coordinate Projection
Datum: NAD 83
Zone: 18N

U.S. Department of the Army
Engineer Research and Development Center
Vicksburg, Mississippi 39201-1001

Prepared by: R. L. Felt, E. W. M. IT, hnd, GY, S.
1 Dept. 805-805-7707

DynCorp



September 23, 2003

Figure 2 1
IHSS 111 4 Trench 7
Subsurface Soil Analytical
Results Greater Than
Background or
Detection Limit

Key

- Subsurface Sample Location
- Paved Area
- Dirt Road
- Stream ditch or drainage
- IHSS 111 2
- IHSS 111 3
- IHSS 111 4
- IHSS 111 5
- IHSS 111 6

Disclaimer
The U.S. Department of Energy
does not warrant the accuracy
of the data or the results of the
analysis. The data are provided
for informational purposes only.
The user is responsible for the
interpretation and use of the
data.



20 0 20 40 60 80 100 120 140 Feet
Scale = 1 1 300
State Plane Coordinate Projection
Colorado Central Zone
Datum NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by



Prepared for











Figure 2.2 Ash Pit Boundaries

EXPLANATION

- Subsurface Soil
- ▲ Surface Soil
- Sediments
- ▼ Groundwater Well

Standard Map Features

- | | | |
|---|-------------------|-------------------|
|  | Building | d other structure |
|  | Dam | libed building nd |
|  | Other Structure | |
|  | Streams, dr, hea, | oth |
|  | dr usage feature | |
|  | T polygon | Conto (2-Foot) |
|  | Paved road | |
|  | D no d | |

[illegible]

NOTE.

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on		Dem	PX4	DS 1		ng
1	2	Ref	A po	Exp emb	CO	nu

Scale	45	05 feet
length up/down		

Strata Plane Coordinate Projection
Colorado Central Zone
Datum: AD83

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R kyfI E v m t lT hnd gys

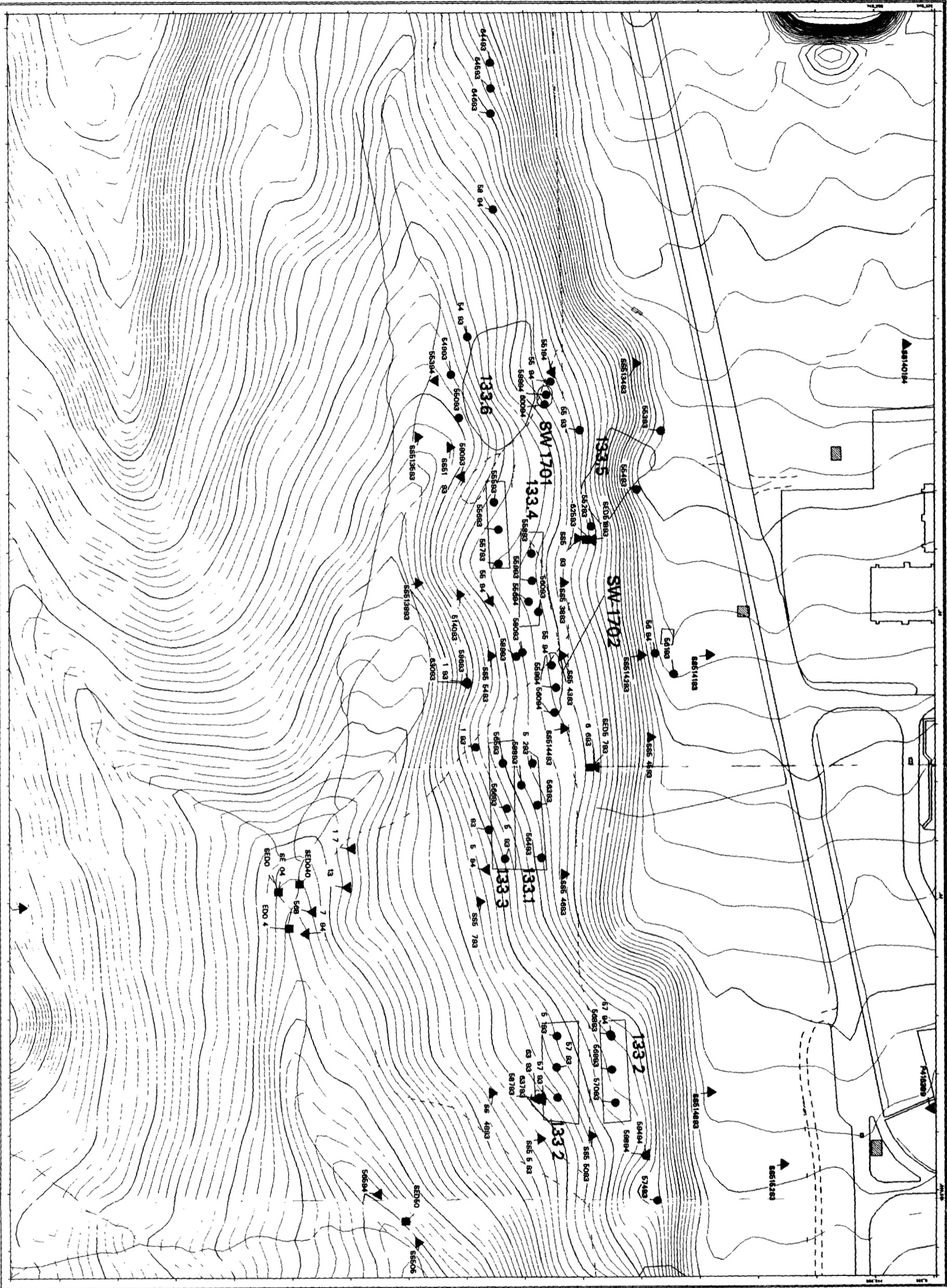
Dept. 303-885-7707

Prepared by	Prepared for

CH2MHILL

KAISER HILL

September 24, 2003



EXPLANATION

- Dirt road

post-processing performed by M.K. Weber 59

Prod	Purp	Seap	mb	CO	nmw
------	------	------	----	----	-----



Colors	Cart	070
aturn	NA	

1-800-368-7707

prepared a

KAISER HILL




NT S /p j /Hy20 3/03 370/ h p hpg m241 h fg2 3 ml

EXPLANATION

● HPGe Location

- ## HPG Location

Standard Map Features

- | | | |
|---|----------------|--------|
|  | Lak | d pond |
|  | Sraama, dthas, | other |
|  | Inge | festu |

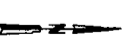
- Topographic Contour (2-Foot)

- Paved and
Dirt road**

DATA SOURCES AND FLATTENING

[illegible]

NOTE									
All	66	AC	⁵	new	App	x			
			Dem	IX4605					
ton	Rad	Rapo		Sep	am	CO	nu	ng d	cam



Scale 25 20
inch presents at



Stat	Plane	Color	hat	Location
Color	do	Cerr		on
Datum	NA			

U S Department of Energy
Rocky Flats Environmental Technology Site










Prepared

18 Dept. 808-866-7707
Prepared



September 24, 2009

EXPLANATION

- | Standard Map Features | |
|---|-------------------------------|
|  | Building not of the structure |
|  | D molished buildi g nd |
|  | Other Structure |
|  | Lake not pond |
|  | Stream, ditch, a, other |
|  | dr ing feature |
|  | T poe ph Conto (2-Foot) |
|  | Paved road |
|  | Driveway |

DATA SOURCE BASE FEEDBACK.
Databases, surveys, hydrographs, maps and other information from 1964 and/or first-year data captured by EROS NSL, Las Vegas.
Derived from the orthophotographs, 1965.
Topographic contours were derived from digital elevation model (DEM) data by Northern Arizona State using EROS NSL TIN and LANTIC to produce the DEM data to each data contour.
The DEM data was captured by the National Surveying Lab, Las Vegas, NV, 1964 Aerial Photos.
No further revision.
DEM post-processing performed by ARC, Winfall 1997

NOTE	PA	Bou n	App	n
All	65	Demos	4605	
on	Real		Sepp	CO nu Up

Scale 2520
inch up front 68

Sta	Plane Coar	hairs	jection
	Color do Cart	one	
	Datum	NAD	

U S Department of Energy
Rocky Flats Environmental Technology Site

Prepared

Dept. 202-866-7700
Prepared



CH2M HILL
CONSTRUCTIONS ITALIE



KAISER HILL

September 24, 2000

Figure 2 6a

IHSS 133 1

Subsurface Soil

Maximum Sampling Results

Greater than Background

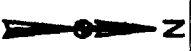
Means Plus Two Standard

Deviations

KEY

- IHSS
- PAC 1702
- Paved area
- Dirt road
- Stream ditch or drainage
- Sampling location

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Scale = 1 1 350

State Plane Coordinate Projection
Colorado Central Zone
Datum NAD 27

U S Department of Energy
Rocky Flats Environmental Technology Site

Prepared for

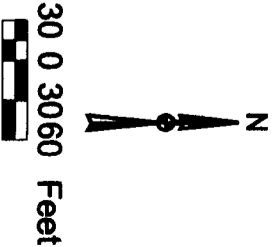


Figure 2 6b
IHSS 133 2
Subsurface Soil
Maximum Sampling Results
Greater than Background
Means Plus Two Standard
Deviations

KEY

- IHSS
- PAC 1702
- Paved area
- Dirt road
- Stream ditch or drainage
- Sampling location

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Scale = 1 1 700
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U S Department of Energy
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Prepared by: [Redacted]
Prepared for: [Redacted]

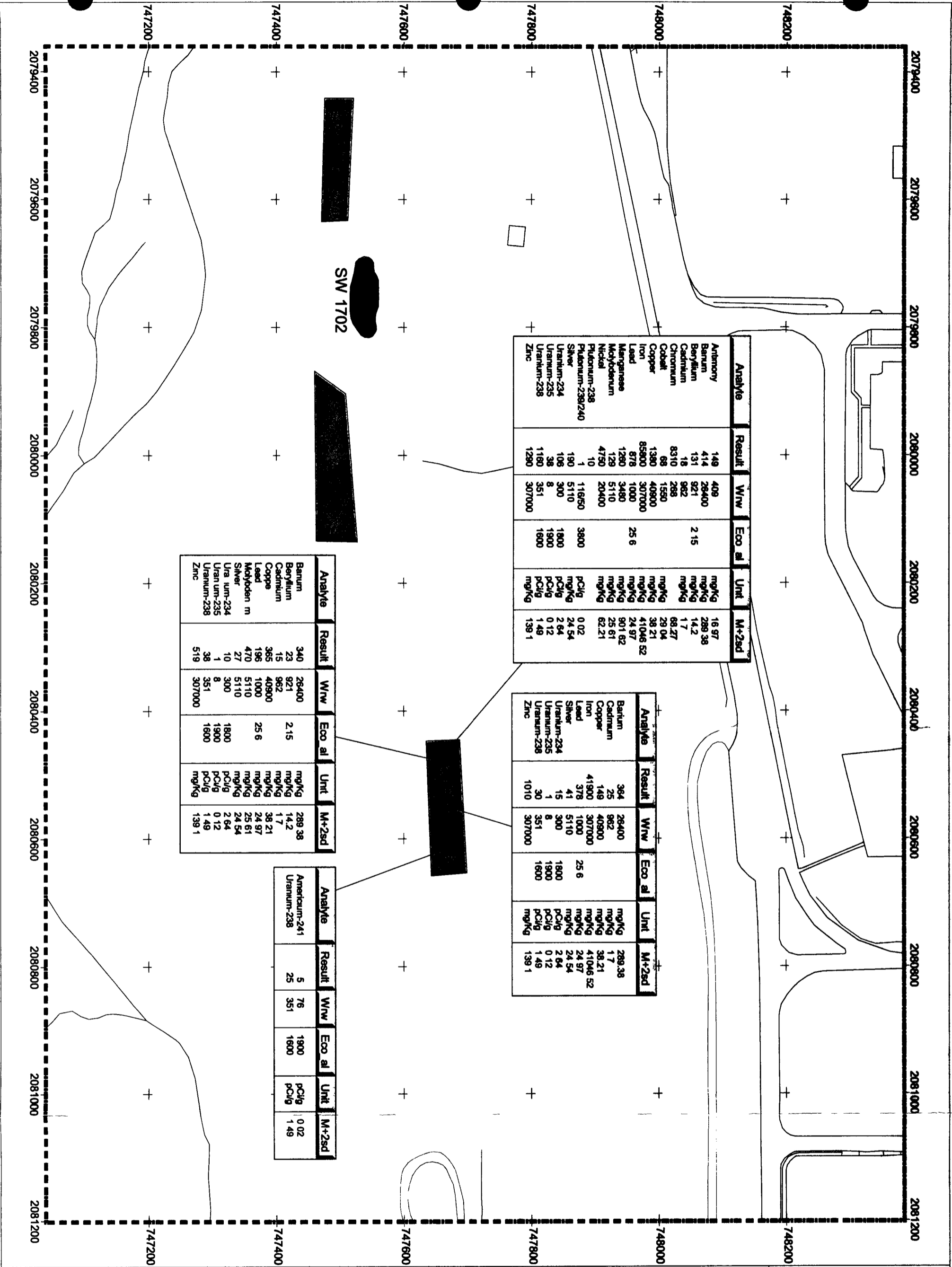
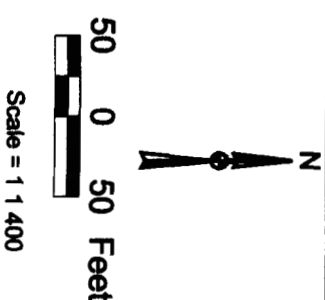


Figure 2 6c
IHSS 133 4
Subsurface Soil
Maximum Sampling Results
Greater than Background
Means Plus Two Standard
Deviations

KEY

- IHSS
- PAC 1702
- Paved area
- Dirt road
- Stream ditch or drainage
- Sampling location

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State Plane Coordinate Projection
Colorado Central Zone
Datum NAD 27

U S Department of Energy
Rocky Flats Environmental Technology Site

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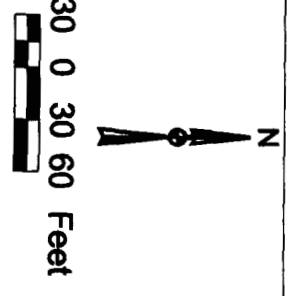


Figure 2 6d
PAC SW 1702
Subsurface Soil
Maximum Sampling Results
Greater than Background
Means Plus Two Standard
Deviations

KEY

- IHSS
- PAC 1702
- Paved area
- Dirt road
- Stream ditch or drainage
- Sampling location

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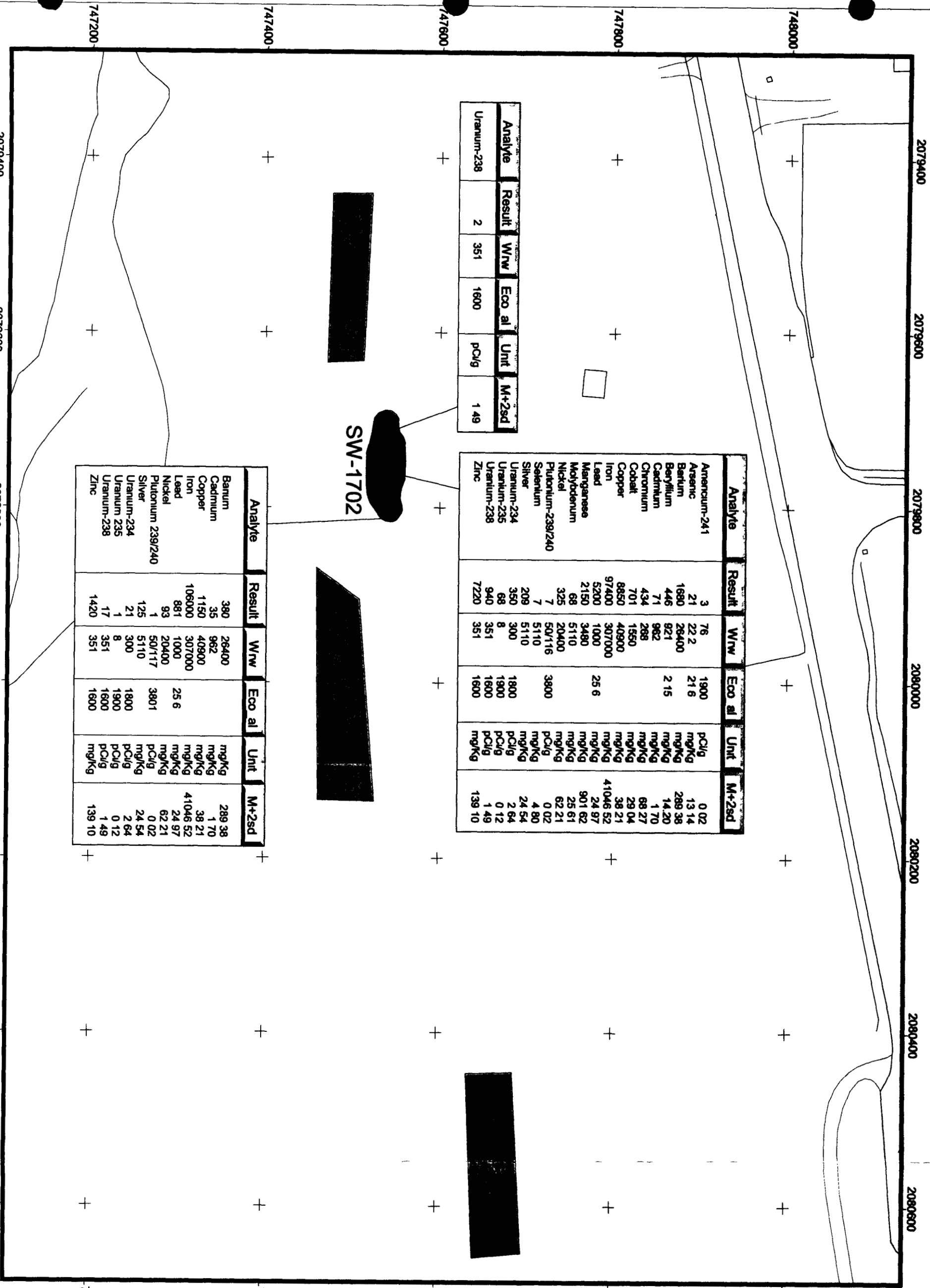
Scale = 1 1 300

State Plane Coordinate Projection
Colorado Central Zone
Datum NAD 27

U S Department of Energy
Rocky Flats Environmental Technology Site

Prepared by

Prepared for



Analyte	Result	W/rw	Eco al	Unit	M+2sd
Americum-241	3	76	1900	pCi/g	0 02
Arsenic	21	22 2	21 6	mg/Kg	13 14
Barium	1690	26400		mg/Kg	289 38
Beryllium	446	921		mg/Kg	14 20
Cadmium	71	962	2 15	mg/Kg	1 70
Chromium	434	288		mg/Kg	68 27
Cobalt	701	1550		mg/Kg	29 04
Copper	8850	40900		mg/Kg	38 21
Iron	97400	307000		mg/Kg	41046 52
Lead	5200	1000	25 6	mg/Kg	24 97
Manganese	2150	3480		mg/Kg	901 62
Molybdenum	68	5110		mg/Kg	25 61
Nickel	325	20400		mg/Kg	62 21
Plutonium-239/240	7	50/116	3800	pCi/g	0 02
Selenium	7	5110		mg/Kg	4 80
Silver	209	5110		mg/Kg	24 54
Uranium-234	350	300	1800	pCi/g	2 64
Uranium-235	68	8	1900	pCi/g	0 12
Uranium-238	940	351	1600	pCi/g	1 49
Zinc	7220	351		mg/Kg	139 10

Analyte	Result	W/rw	Eco al	Unit	M+2sd
Uranium-238	2	351	1600	pCi/g	1 49

Analyte	Result	W/rw	Eco al	Unit	M+2sd
Barium	380	26400		mg/Kg	289 38
Cadmium	35	962		mg/Kg	1 70
Copper	1150	40900		mg/Kg	38 21
Iron	106000	307000		mg/Kg	41046 52
Lead	881	1000	25 6	mg/Kg	24 97
Nickel	93	20400		mg/Kg	62 21
Plutonium 239/240	1	50/117	3801	pCi/g	0 02
Silver	125	5110		mg/Kg	24 54
Uranium-234	21	300	1800	pCi/g	2 64
Uranium 235	1	8	1900	pCi/g	0 12
Uranium-238	17	351	1600	pCi/g	1 49
Zinc	1420	351		mg/Kg	139 10

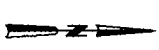
SW-1702

Figure 2 7
100 Year Flood Plain
in the Ash Pits Area

EXPLANATION

- 100 Year Flood
- Ash Pits
- Standard Map Features
 - Buildings and other structures
 - Demolished buildings and Other Structures
 - Lakes and ponds
 - Streams ditches or other drainage features
 - Fences and other barriers
 - Topographic Contour (20 Foot)
 - Rocky Flats Environmental Technology Site boundary
 - Paved roads
 - Dirt roads

DATA SOURCE BASE FEATURES
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data acquired by Edgell RSL, Las Vegas.
Digitized from the orthophotograph, 1995
Topographic contours were derived from digital elevation model (DEM) data by Morrison Knudsen (MK) using ESRI Arc Triangulated Irregular Network (TIN) and LANTIER process the DEM data to create 5 foot contours. The DEM data was captured by the Nevada Surveying Lab, Las Vegas NV, 1994 Aerial Flyover at 10 meter resolution. DEM post-processing performed by MK, Winter 1997

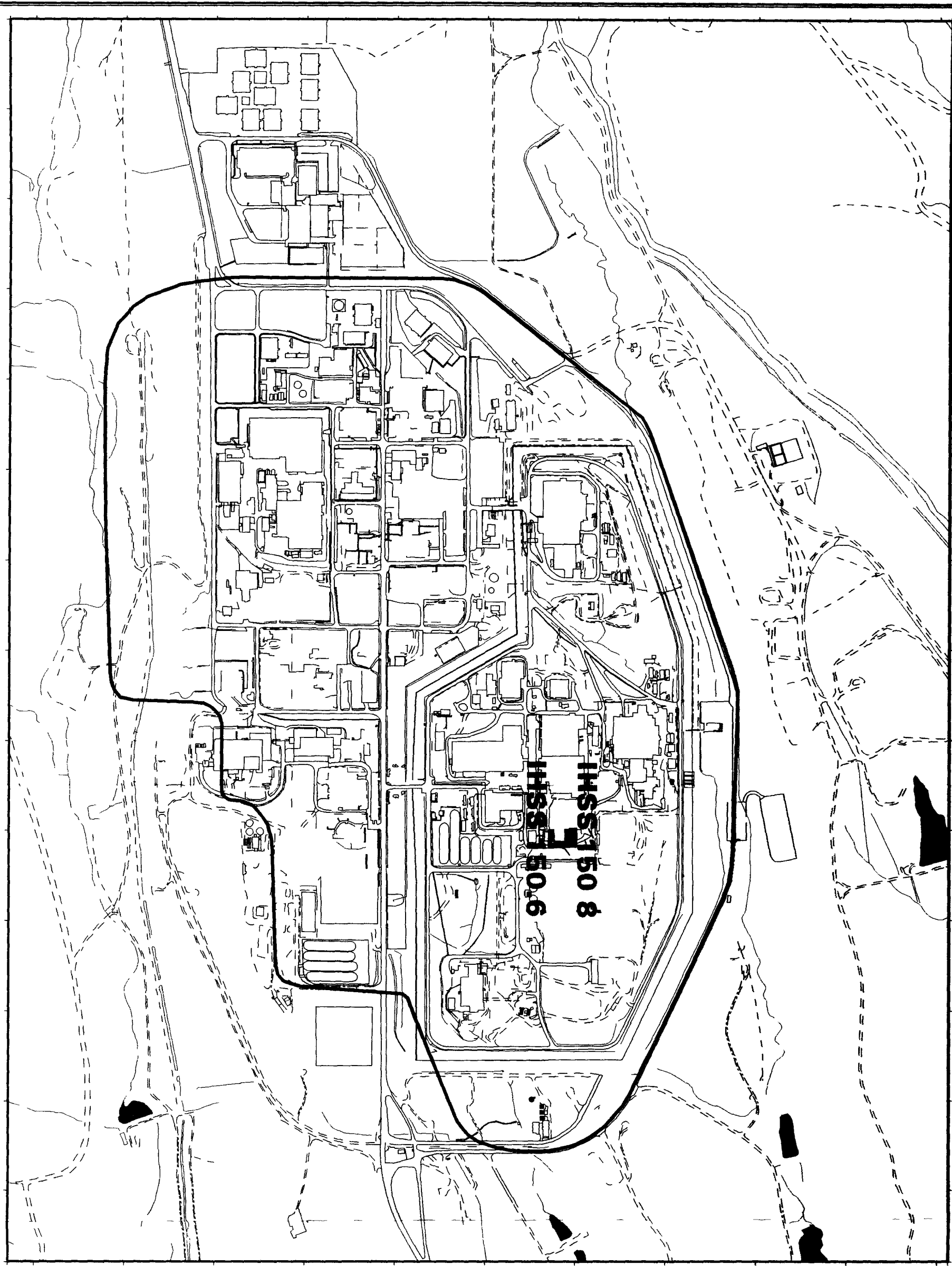


Scale 1:3740
1 inch represents approximately 312 feet

Site Plane Coordinate Projected
Colorado North Zone
Datum NAD83

U S Department of Energy
Rocky Flats Environmental Technology Site

Figure 2.8
IHSS 150.6 & 150.8 Locations



EXPLANATION

■ IHSS 150.6
■ IHSS 150.8

Standard Map Features

□ Building & the structure

■ Lake and pond

— Stream, ditch, or other large feature

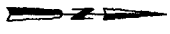
— Fence & other barrier

— Paved road

— Dirt road

N
Boat dry
I. dust
I. Area Op
bl U

DATE: 2003-08-08
PROJECT: Rocky Flats Environmental Technology Site
DRAWN: [Name]
CHECKED: [Name]
APPROVED: [Name]
REVISIONS: [List]
DIGITIZED FROM: [Source]



Scale: 1 inch = 800 feet
1 inch = 1000 feet



Site: Rocky Flats Environmental Technology Site
Contract: [Number]
Drawing: [Number]

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Doc. No. ENE-7707

DRAFT

September 24, 2003

Figure 2.9
IHSS 150.6 & 150.8 Surface Soil
Sampling Locations

EXPLANATION

IHSS 150.6
IHSS 150.8

Sample Location

Standard Map Features

Building and other structures

Lake and pond

Stream, ditch, or other
drainage feature

Fence and other barrier

Paved road

Dirt road

OF SOURCE WATER FEATURES:
This map was prepared using the
National Hydrographic Survey (NHS)
data, which is the most current
available. The data was obtained from
the National Hydrographic Survey (NHS)
and is the most current available.
The data was obtained from the
National Hydrographic Survey (NHS)
and is the most current available.
The data was obtained from the
National Hydrographic Survey (NHS)
and is the most current available.



Scale 1:15,400
1 inch = 128 feet



State Plane Coordinate System
Colorado State Plane
Datum: NAD27

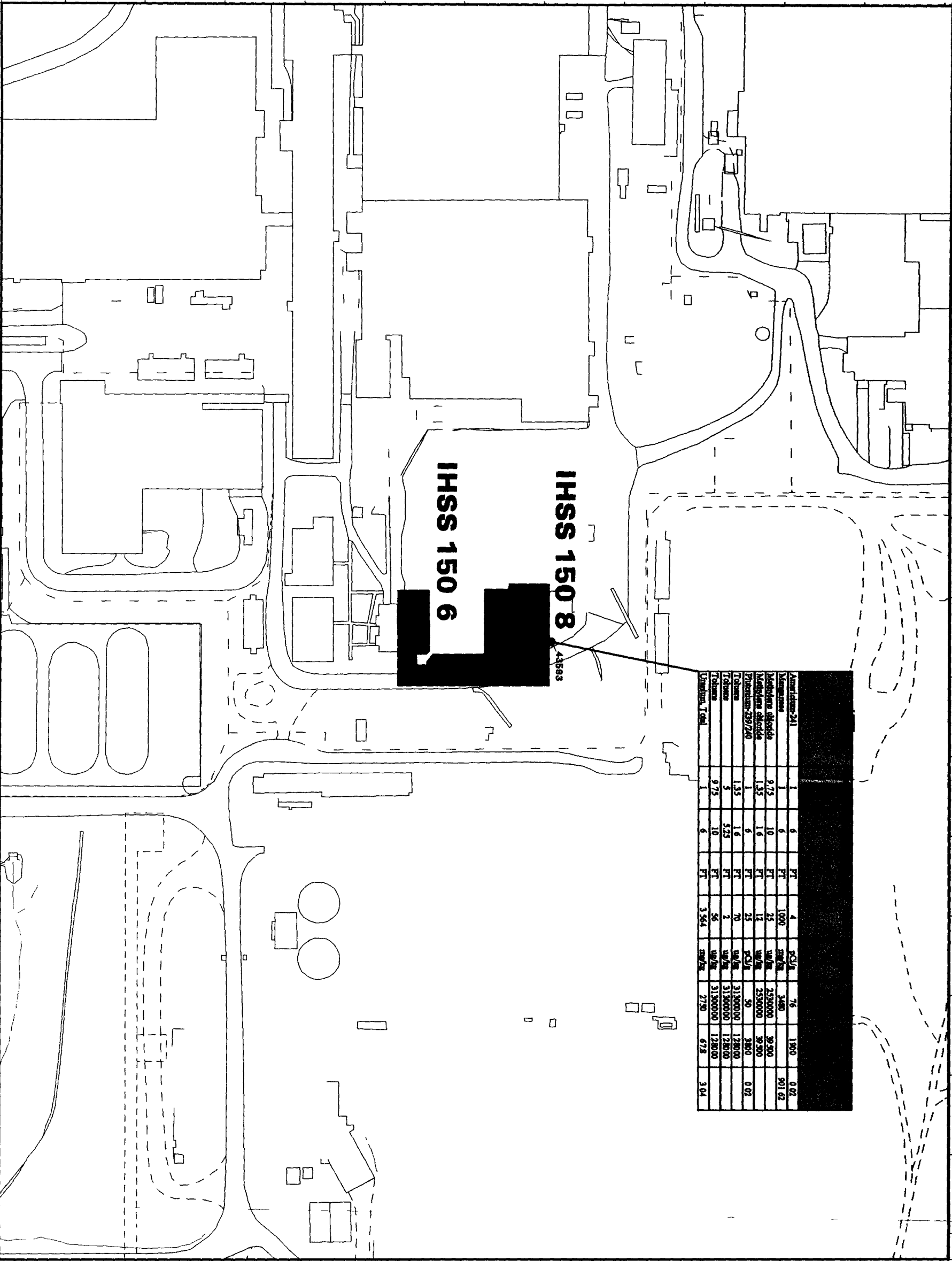
U.S. Department of Energy
Rocky Flats Environmental Technology Site

DOE/ER-000-000-000

DRAFT

September 24, 2003

Figure 2 12
IHSS 150.6 & 150.8 Subsurface Soil
Contaminant Distribution



EXPLANATION

- IHSS 150.6
- IHSS 150.8
- Sample Location

Standard Map Features

- Building and the structure
- Lake and pond
- Stream, ditch, or other water feature
- Fence and other barriers
- Paved road
- Dirt road

Scale

1 inch = 1540 feet

Scale bar: 0 to 1540 feet

North Arrow

North arrow pointing up

Site Information

Site: Rocky Flats Environmental Technology Site

Project: Contaminant Distribution

Date: 12/12/03

U.S. Department of Energy

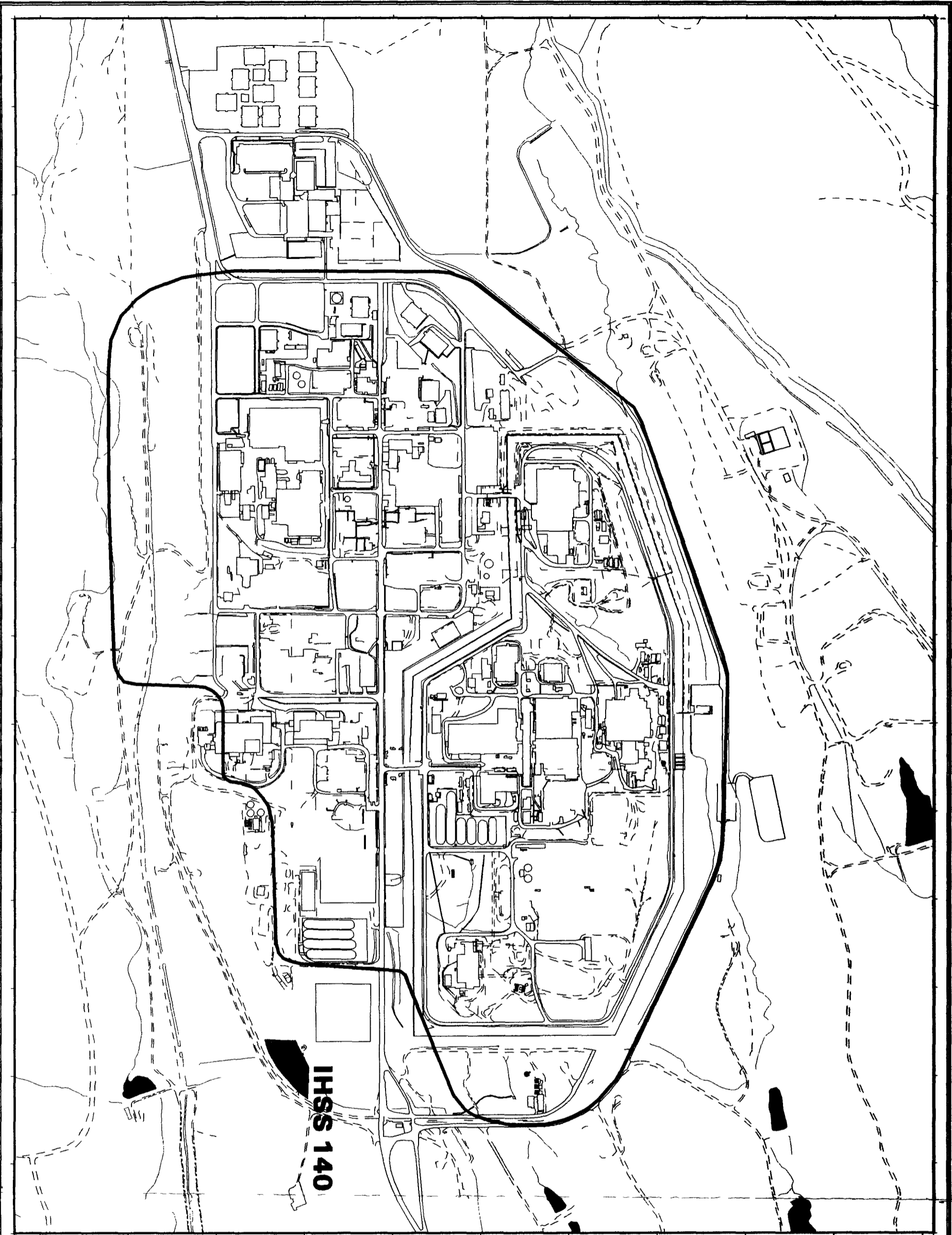
Rocky Flats Environmental Technology Site

1540-000-000

DRAFT

September 24, 2003

Figure 2 13
IHSS 140 Location



EXPLANATION

■ IHSS 140

Standard Map Features

□ Building and other structure

■ Lake and pond

— Stream, ditch, or other feature

— Fence and other barrier

== Paved road

= Driveway

N
Indicate Orientation

Source of Features
The features shown on this map were derived from the following sources:
1. Aerial photography (1995)
2. Topographic maps (1995)
3. Other maps (1995)
4. Other data (1995)
5. Other data (1995)
6. Other data (1995)
7. Other data (1995)
8. Other data (1995)
9. Other data (1995)
10. Other data (1995)

Scale 1:8060
1 inch = 672 feet

0 100 200

Site Plan
City and County of Boulder
Department of Planning and Development
Date: March 2007

U S Department of Energy
Rocky Flats Environmental Technology Site

DRAFT

September 24, 2003

EXPLANATION

ISS 140

● **Sample Location**

Standard Map Features

Building and other structures

Lat end po d

Streams, ditches, other
drainage feature

Fan clothes business

Paved d

Dirt road

N 1 d st 1 Area Op b l U n
Bou dary

D4 SOUND MADE FEUTURES.
 POC
 Medical Science Report #100
 and Journal #100
 Sept. 30, 1977
 Published/Unpublished Science Data #100
 Doc. 100, 100 Report and Subsequent Updates
 Analysis, Science, Technology, Trends and other
 information from 1964 until 1977 was data
 acquired by ESOE RCI, in 1976.
 Digitized from the microfilm copy, 1976



Sc 1 1 1680
1 h pr as t 140 t



Str + Pl Co d at Pr , ti
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Det m NAD27

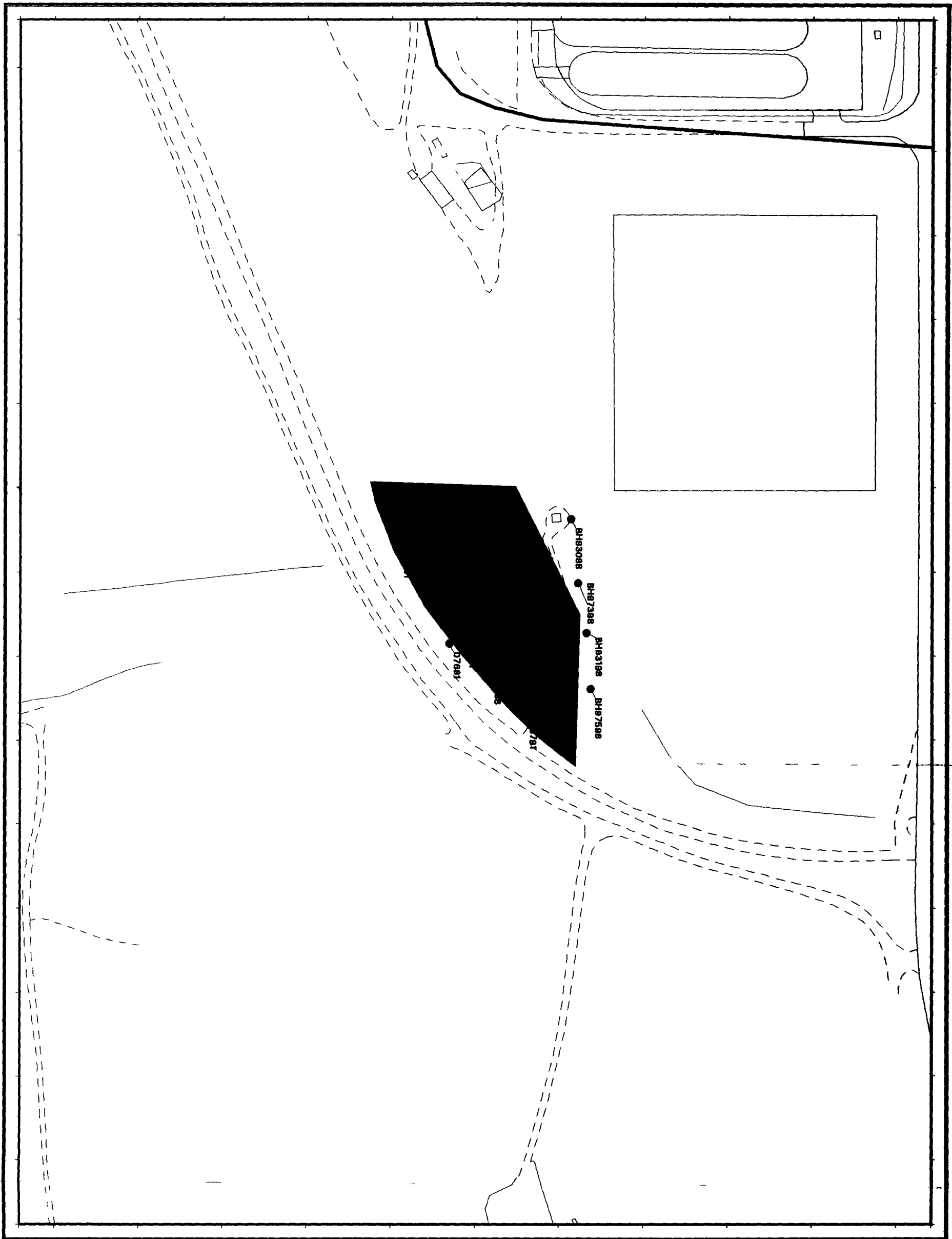
**U S Department of Energy
Rocky Flats Environmental Technology**

Dept. 303-888-7707

DRAFT

September 24, 2003

Figure 2.15
IHSS 140 Subsurface Soil
Sampling Locations



EXPLANATION

IHSS 140

Sample Location

Standard Map Features

Building structure

Lake pond

Stream, ditch, other

Fence, double line

Paved road

Dirt road

Industrial Area, Open U r

DATA SOURCE: STATE OF CALIFORNIA
INTEGRATED HYDROLOGICAL SURVEY (IHS)
INTEGRATED HYDROLOGICAL SURVEY (IHS)
INTEGRATED HYDROLOGICAL SURVEY (IHS)
INTEGRATED HYDROLOGICAL SURVEY (IHS)
INTEGRATED HYDROLOGICAL SURVEY (IHS)
INTEGRATED HYDROLOGICAL SURVEY (IHS)
INTEGRATED HYDROLOGICAL SURVEY (IHS)
INTEGRATED HYDROLOGICAL SURVEY (IHS)
INTEGRATED HYDROLOGICAL SURVEY (IHS)
INTEGRATED HYDROLOGICAL SURVEY (IHS)



Scale 1:1680
1 inch represents 140 feet



State of California
Department of Water
Division of Hydrologic Sciences
Sacramento, California

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Date: 2003-09-27

DRAFT

September 24, 2003

EXPLANATION

Standard Map Features

☐ Building and other structures

Lake and po da
 Streams, ditches, oth
 dr inge fastu
 Feno d the barr re
 Paved oad
 Drt d

N | dust | Area Ops | U | r
Boundary

DATA SOURCE: BAE FEELWEX.
PAC.
International Business Report #1986
and #1987
Exp. Int. 88/91

DRAFT

September 24, 2003

Figure 2 19
Building 991 Tunnel
UBC Sampling Location
Results Greater Than
Background Means Plus
Two Standard Deviations
or Detection Limits

KEY

- Sampling location
- Building
- UBC Site
- IHSS
- PAC
- OPWL
- NPWL
- Foundation drain
- Storm drain
- Stream
- Paved Road

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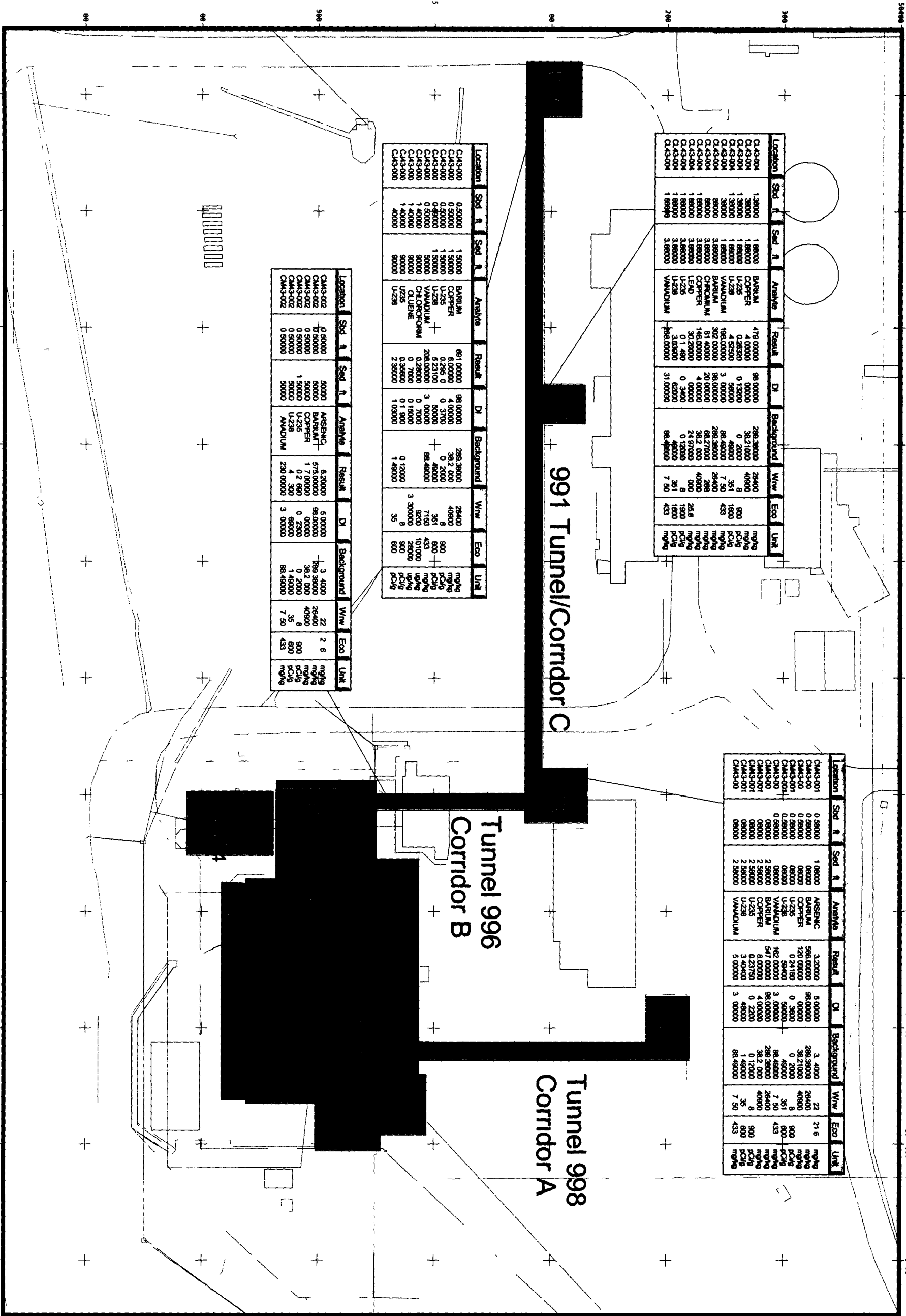
50 0 50 Feet
Scale = 1 1 000

State Plane Coordinate Projection
Colorado Central Zone
Datum NAD 27

U S Department of Energy
Rocky Flats Environmental Technology Site

Prepared by

Prepared for



Location	Std. R.	Std. R.	Analyte	Result	DI	Background	W/W	Eco	Unit
C43-004	1.38000	1.86000	BARILUM	479.00000	98.00000	289.39000	28400	900	mg/kg
C43-004	1.38000	1.86000	COOPER	0.28330	0.13200	0.2000	8	1600	PC/g
C43-004	1.38000	1.86000	U-235	4.62590	56000	46000	351	433	mg/kg
C43-004	1.86000	3.88000	BARILUM	198.00000	98.00000	289.39000	26400	8	mg/kg
C43-004	1.86000	3.88000	COOPER	81.40000	20.00000	68.27000	288	40000	mg/kg
C43-004	1.86000	3.88000	LEAD	146.00000	4.00000	36.2.000	000	25.6	mg/kg
C43-004	1.86000	3.88000	U-235	30.20000	0.3400	24.97000	8	1900	PC/g
C43-004	1.86000	3.88000	U-238	0.1480	0.62000	0.4800	351	1600	PC/g
C43-004	1.86000	3.88000	VANADIUM	3.03800	31.00000	88.49000	7.50	433	mg/kg

Location	Std. R.	Std. R.	Analyte	Result	DI	Background	W/W	Eco	Unit
C43-000	0.50000	1.50000	BARILUM	891.00000	98.00000	289.39000	28400	900	mg/kg
C43-000	0.50000	1.50000	COOPER	6.00000	4.00000	38.2.000	40900	8	mg/kg
C43-000	0.50000	1.50000	U-235	0.2960	0.3700	0.2000	351	433	mg/kg
C43-000	0.50000	1.50000	U-238	5.23100	50000	46000	7150	800	PC/g
C43-000	0.50000	1.50000	VANADIUM	208.00000	3.00000	88.49000	8200	101000	mg/kg
C43-000	0.50000	1.50000	CHLOROCFORM	0.28000	0.7000	0.15000	300000	28000	mg/kg
C43-000	1.40000	90000	U-235	0.7000	0.15000	0.12000	3	800	PC/g
C43-000	1.40000	90000	U-238	0.35600	0.1900	1.48000	35	800	PC/g

Location	Std. R.	Std. R.	Analyte	Result	DI	Background	W/W	Eco	Unit
CMA3-002	0.50000	50000	ARSENIC	6.20000	5.00000	3.4000	22	2.6	mg/kg
CMA3-002	0.50000	50000	BARILUM	575.00000	98.00000	289.39000	26400	8	mg/kg
CMA3-002	0.50000	50000	COOPER	1.7.00000	0.00000	38.2.000	40900	900	PC/g
CMA3-002	0.50000	50000	U-235	0.2.690	0.2300	0.2000	35	600	PC/g
CMA3-002	0.50000	50000	U-238	4.300	68000	1.48000	7.50	433	mg/kg
CMA3-002	0.50000	50000	VANADIUM	230.00000	3.00000	88.49000	8	433	mg/kg

Location	Std. R.	Std. R.	Analyte	Result	DI	Background	W/W	Eco	Unit
CMA3-001	0.98000	1.08000	ARSENIC	3.20000	5.00000	3.4000	22	21.6	mg/kg
CMA3-001	0.98000	1.08000	BARILUM	568.00000	98.00000	289.39000	26400	8	mg/kg
CMA3-001	0.98000	1.08000	COOPER	120.00000	0.00000	38.21000	40900	900	PC/g
CMA3-001	0.98000	1.08000	U-235	0.24180	0.3600	0.2000	351	433	mg/kg
CMA3-001	0.98000	1.08000	U-238	58400	58000	46000	7.50	433	mg/kg
CMA3-001	0.98000	1.08000	VANADIUM	182.00000	3.00000	88.49000	26400	8	mg/kg
CMA3-001	0.98000	1.08000	BARILUM	547.00000	98.00000	289.39000	40900	900	PC/g
CMA3-001	0.98000	1.08000	COOPER	8.00000	4.00000	38.2.000	8	600	PC/g
CMA3-001	0.98000	1.08000	U-235	0.223750	0.2200	0.12000	35	433	mg/kg
CMA3-001	0.98000	1.08000	U-238	3.40400	0.48000	1.48000	7.50	433	mg/kg
CMA3-001	0.98000	1.08000	VANADIUM	5.00000	3.00000	88.49000	8	433	mg/kg

Tunnel 996
Corridor B

Tunnel 998
Corridor A

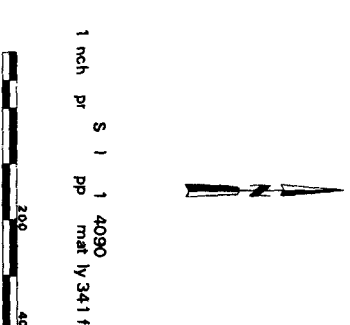
991 Tunnel/Corridor C

Figure A 3 I
2003 Historical Release Report
Generated Soils Returned
to Place of Origin

EXPLANATION
O S # Repl m nt Ave
Standard Map Features

- Bul d gs and othe t uctu es
- Demol shed building nd
- Othe St uctu e
- Lakes nd po d
- St em d t he o oth draining f tu es
- Fenc nd other b es
- Pa d ds
- D t o d

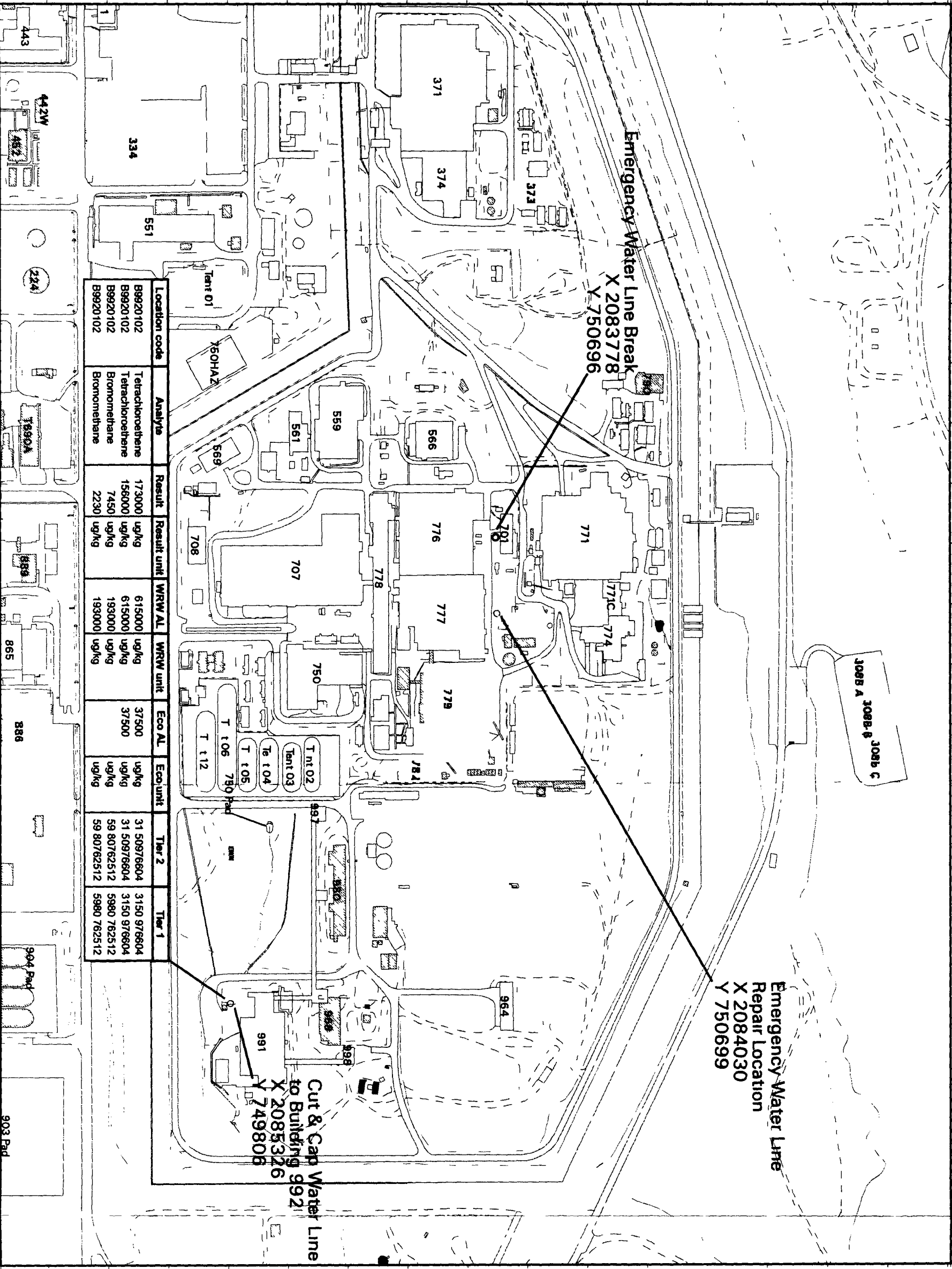
DATA SOURCE BASED FEATURES
Maples, pines, poplars, oaks and other
structures from 34' air photo data
not used by 60' NSL, Las Vegas
apt not from h to topography 19



Sr t Pl meCo d t P r i
Col ed Co al Z
D t m NAD27

U S Department of Energy
Rocky Flats Environmental Technology Site

Prepared by CH2M HILL
Prepared by KANSER HILL
S p m b e 10, 2003



Location code	Analyte	Result	Result unit	WRWL AL	WRWL unit	Eco AL	Eco unit	Tier 2	Tier 1
B9920102	Tetrachloroethene	173000	ug/kg	615000	ug/kg	37500	ug/kg	31 50976604	3150 976604
B9920102	Tetrachloroethene	156000	ug/kg	615000	ug/kg	37500	ug/kg	31 50976604	3150 976604
B9920102	Bromomethane	7450	ug/kg	193000	ug/kg		ug/kg	59 80762512	5980 762512
B9920102	Bromomethane	2230	ug/kg	193000	ug/kg		ug/kg	59 80762512	5980 762512

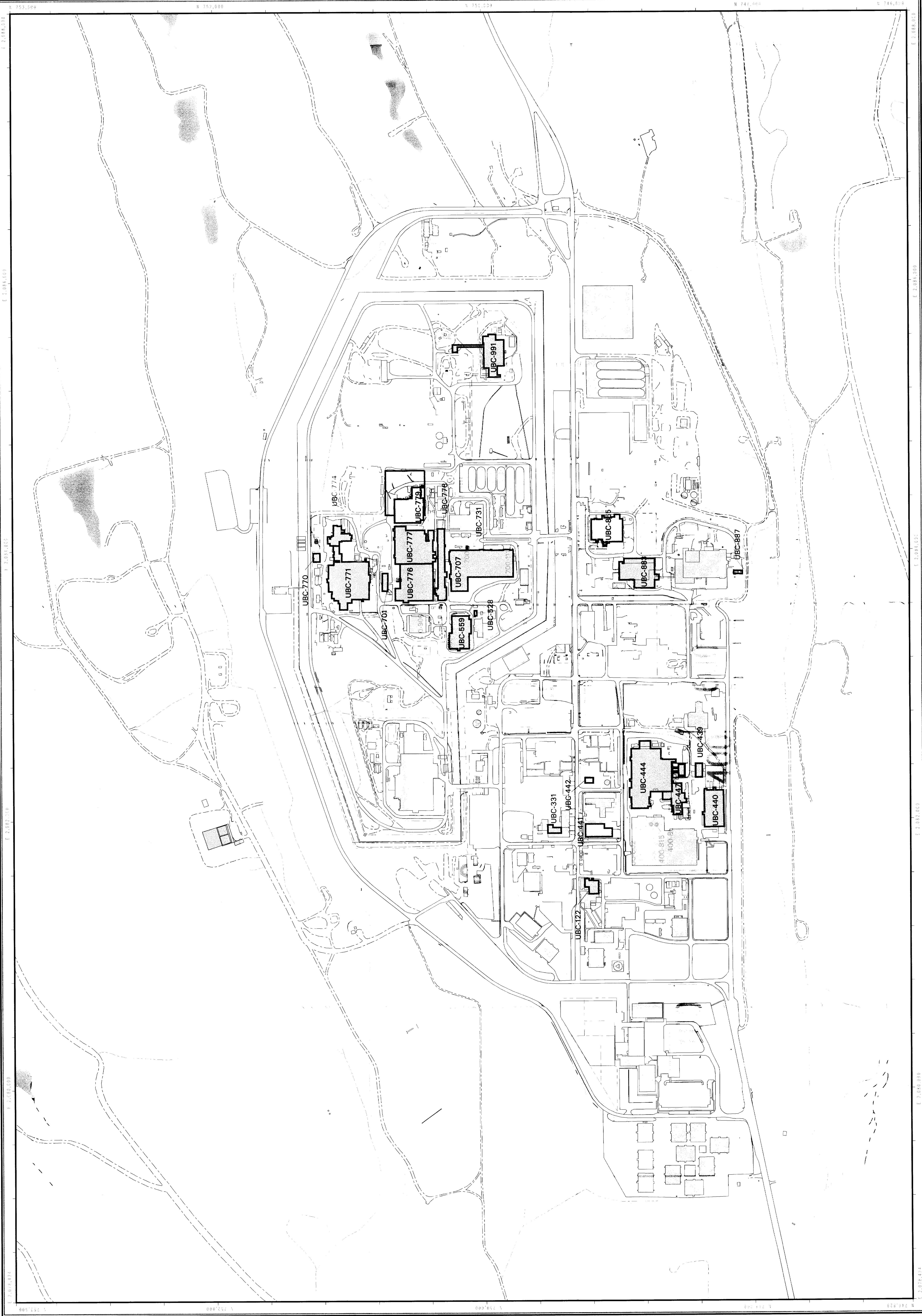


Plate 4

Potential Areas of Concern
And Under Building Contamination Sites
(As of Sept. 2003)

EXPLANATION

UBC-559 Under Building Contamination Site

SE-1602 Potential Area of Concern

400-813 Potential Area of Concern
Point Spill (not to scale)

Standard Map Features

Buildings and other structures

Lakes and ponds

Streams, ditches, or other
drainage features

Fences and other barriers

Paved roads

Dirt roads

HRR Designation Area Boundary

DATA SOURCE BASE FEATURES:
Topographic features: Structures, Sites, HRRS,
400-813, 400-814, 400-815, 400-816, 400-817,
400-818, 400-819, 400-820, 400-821, 400-822,
400-823, 400-824, 400-825, 400-826, 400-827,
400-828, 400-829, 400-830, 400-831, 400-832,
400-833, 400-834, 400-835, 400-836, 400-837,
400-838, 400-839, 400-840, 400-841, 400-842,
400-843, 400-844, 400-845, 400-846, 400-847,
400-848, 400-849, 400-850, 400-851, 400-852,
400-853, 400-854, 400-855, 400-856, 400-857,
400-858, 400-859, 400-860, 400-861, 400-862,
400-863, 400-864, 400-865, 400-866, 400-867,
400-868, 400-869, 400-870, 400-871, 400-872,
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400-893, 400-894, 400-895, 400-896, 400-897,
400-898, 400-899, 400-900, 400-901, 400-902,
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400-973, 400-974, 400-975, 400-976, 400-977,
400-978, 400-979, 400-980, 400-981, 400-982,
400-983, 400-984, 400-985, 400-986, 400-987,
400-988, 400-989, 400-990, 400-991, 400-992,
400-993, 400-994, 400-995, 400-996, 400-997,
400-998, 400-999, 400-1000. Digitized from the
aerial photographs, 1/95.

NOTES:
All IHSS and PAC's Boundaries are Approximate. For more detail,
please contact Environmental Restoration (X4605) for the following
document:
Historical Release Report (HRR) September 2003 Annual Update



Scale = 1 : 3600
1 inch represents 300 feet



State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared for:



September 25, 2003

SW-A-CC437 Page 282

No Further Action Individual Hazardous Substance Sites and Potential Areas of Concern

Operable Unit 1 (Closed through CAD/ROD Process)

Former Operable Unit 2
Former Operable Unit 4
Operable Unit 5
Operable Unit 6
Operable Unit 7

Former Operable Unit 8
Process Waste IHSS Locations
(Former OU 9 IHSSs)

Former Operable Unit 10

Former Operable Unit 12

Former Operable Unit 13

Operable Unit 15 (Closecreek)

Operable Unit 16 (Closed)

Potential Area of Concern

No Further Action PACs approved by Colorado Department of Health and EPA in 1992.

Under Building Contamination Site

FOAMED & STABILIZED LANKS
(Source Removed - RCRA Interim Status)

Industrial Area C

Boundary
HBB Designation Area Boundary

Standard Map Features

Buildings and other structures

Solar Evaporation Ponds (SEPs)

Lakes and ponds

Streams, ditches, or other drainage features

Fences and other barriers

Paved roads

Dirt roads

DATA SOURCE BASE FEATURES:

DATA SOURCE BASE FEATURES:
Locations of the Operable Unit(s) and their associated Individual Hazardous Substance Sites (IHSS) were derived from the DOE 1992 - IRR Report and subsequent updates.
Operable Unit(s) 1, 3, 11, 16 are designated to be NFA by the Corrective Action Decision/Record of Decision (CAD/ROD).
Buildings, fences, topography, roads and other structures from 1994 aerial fly-over data captured by EG&G NSL, Las Vegas.
Digitized from the orthophotographs. 1/95

NOTES:
All IHSS and PAC's Boundaries are Approximate. For more detail, please contact Environmental Restoration(X4605) for the following document:

Historical Release Report (HRR) September 2003 Annual Update

Scale = 1 : 4800
1 inch represents 400 feet

Scale = 1 : 4800
1 inch represents 400 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy

Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

or:



September

Sw-A-CC 4837 pg 280

Plate 1

Individual Hazardous
Substance Sites by
Consolidated Operable Unit

(As of Sept. 2003)

Industrial Area Operable Units

Industrial Area OU

Buffer Zone Operable Units

Buffer Zone OU

Operable Unit 5

Operable Unit 6

Operable Unit 7

NOTES:

Other Map Features

Buildings and other structures

Demolished buildings and
Other Structures

Lakes and ponds

Streams, ditches, or other
drainage features

Fences and other barriers

Paved roads

Dirt roads

Industrial Area Operable Unit
Boundary

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other
structures from 1994 aerial fly-over data
Demolished buildings and other structures
Digitized from the orthophotographs, 1995
Individual Hazardous Substance Sites (IHSSs)
DOE, 1992, HRR Report and Subsequent Updates
All IHSS and PAC's Boundaries are Approximate. For more
information, see the Environmental Restoration (IX4605)
for the following document:
Historical Release Report (HRR) September 2003 Annual Update

Scale = 1:3800
1 inch represents 300 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

Prepared for:



September 25, 2003

SAC A-C-18-37 18, 279

BUFFER ZONE
OPERABLE UNIT
(EPA LEAD)

INDUSTRIAL AREA
OPERABLE UNIT
(CDPHE LEAD)

SOUTHWEST

SOUTHEAST

Historical Release Report
Original Process Waste Lines
and
New Process Waste Lines

- EXPLANATION**
- Tanks of Concern
 - Formed and Stabilized Tanks (Source Removed - Interim Status)
 - Remaining Tanks
 - Sumps
 - Process Waste IHSS Locations (Former OU 9 IHSS)
 - Original Process Waste Lines (IHSS 000-121)
 - OPWL Removed
 - OPWL at 3 feet or overhead line
 - OPWL at approximately 3.5 feet
 - OPWL between 3 to 5 feet
 - Approximate Location of New Process Waste Lines (PAC 000-504)
 - NPWL Removed
 - NPWL Cleaned - Closed
 - Known Leaks
 - Suspected Leaks
 - Manholes

- Standard Map Features**
- Buildings and other structures
 - Demolished buildings and Other Structures
 - Lakes and ponds
 - Streams, ditches, or other drainage features
 - Fences and other barriers
 - Paved roads
 - Underground tunnels

DATA SOURCE BASE FEATURES: See IHSSU TDE 1992 IRR Report and Subsequent Updates.

NOTES:

All IHSS and PAC's Boundaries are Approximate. For more information, please refer to the Rocky Flats Environmental Restoration (X4605) Historical Release Report (HRR) September 2003 Annual Update.

Scale = 1" = 2450'
1 inch represents approximately 204 feet
State Plane Coordinate Projection
Contiguous Zone
Datum: NAD83

U.S. Department of Energy
Rocky Flats Environmental Technology Site
GIS Dept. 303-966-7707
Prepared by:



September 28, 2003

